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TRAVEL BY AIR AS AN AID TO EDUCATION

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TRAVEL BY AIR AS AN AID TO EDUCATION

Submitted by

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TO AUDREY

FOR HER LOVE AND IMMEASUREABLE
HELP IN MAKING THIS THESIS POS-
SIBLE

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CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

It is an accepted fact that aviation facilities have been placed at the disposal of individual public school classes in many cities and towns throughout the United States to aid in rapidly expanding school programs of aviation education. Guided tours of airports, inspection of aviation equipment, and even occasional brief flights have all proved their educational worth. They have, therefore, all been heartily endorsed by teachers and administrators genuinely interested in teaching geared to the Air Age.

One outcome of this liaison between the fields of aviation and education has been the introduction into the curricula of aviation-minded schools of special courses in aviation as well as units on aviation within the framework of other courses.

Another outcome has been the encouragement, given to school systems by proponents of aviation education, to expand school curricula so as to include materials suitable for the Air Age where such materials had previously been lacking. In Massachusetts, for example, educators were told that they must "make themselves more effective by adapting the schools to the economic, sociological, and political changes which have been and are being brought about by aviation."[1]

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[1] The Massachusetts Aviation Committee, Aviation Education Material, the Massachusetts Aeronautics Commission and the Massachusetts Department of Education. Boston, 1946, p. 9.

To implement aviation education in Massachusetts and in other states, teaching aids on aeronautical subjects were introduced in school classrooms; special classes and institutes for teachers were set up; and the services of the Civil Aeronautics Administration, the various State Departments of Education, and other interested organizations were enlisted.

As its name implies, most aviation education up to a few years ago centered around the airplane. Recently, however, a new phase of aviation education..which might conveniently be called the "flying class"..began with the first use of airplanes to transport classes to places of educational importance not easily accessible by ordinary means of transportation. Classes which have first been given basic aviation orientation by classroom lectures supplemented by audio-visual aids have taken flights to such places as Flushing Meadows (New York) to observe the sessions of the United Nations; or they have gone on flights to observe, from the air, geological formations, the destructive power of forest fires, and the like.

Obviously the educational objectives of teachers participating in "flying classes" are not centered directly about the airplane, as was most aviation education prior to the advent of the "flying class". Instead, their primary interest is in the educational value of the places visited and sights seen, with an understanding and appreciation of the airplane itself as a concomitant learning-product of secondary importance.

The Problem

It is the purpose of this study to investigate this new outgrowth of aviation, the "flying class", in an effort to determine its feasibility, or practicality, in public schools in general and those of Massachusetts

in particular. Special emphasis has been placed on the current status of air education in Massachusetts as a barometer of nationwide trends in air education.

Procedure

The following techniques have been utilized in this study:

1 Information was gathered on the success of previous "flying classes" from the standpoint of difficulties encountered in their organization and administration, by means of an investigation into the literature on the subject.

2 Letters were sent out to Eastern Air Lines, and to Air-Age Education Research, sponsored by American Airlines, as organizations professedly and understandably interested in air education, to ascertain: their willingness to cooperate in transporting classes; the facilities which they might offer; expenses entailed; and the possibility of establishing special student rates.

3 Information concerning insurance provisions, the extent of past cooperation by state and local boards of education, and data on accident rates in air travel, were ascertained from the Office of Aviation Information and Statistics (Washington, D.C.), the Civil Aeronautics Board (New York, New York), and the Massachusetts Department of Education (Boston, Massachusetts).

4 The opinions of school superintendents in Massachusetts as to the feasibility of "flying classes" were found by means of questionnaires sent by mail to the superintendents of schools in Massachusetts towns, cities, and superintendency unions.

All necessary data were gathered, organized, and analyzed. The results of this analysis constitute the body of the study.

Scope of the Study

Some of the conclusions stated *infra* are in part the result of information gathered from several of the major airlines which have outlets in Massachusetts. Other conclusions are, in addition, based upon or influenced by information gathered from: recorded observations of "flying classes"; the Massachusetts Department of Education; the Civil Aeronautics Administration; the Office of Aviation Information and Statistics; and other sources of information which are mentioned in the body of the study. Most emphasis, however, has been placed upon the replies of Massachusetts school superintendents as to their cooperation..past, present, and future..in programs of air education.

Justification of the Study

The value of experience over classroom presentation in specific instances; the undisputed value of audio-visual aids to education; the economy in time of air travel over other means of transportation; and the value, in the past, of experiences in the field of aviation..such as "familiarization", or "orientation", flights of students..are in themselves adequate justification of a study of this nature.

Restatement of the Problem

The problems raised by the advent of the "flying class" are many: school and teacher liability; insurance provisions for students; parental permission for flights, to mention but a few. However, these are for the

most part secondary in importance to the problem of administrative approval of flights. An investigation into this latter problem..with a glance at some of the other problems..will constitute the body of this study.

CHAPTER II

BACKGROUND RESEARCH OF THE THESIS

The History of Aviation Education Prior to the "Era of the Flying Class"

In 1903, Orville and Wilbur Wright demonstrated to the world that not only a machine that was heavier than air but man himself might fly. Not until 1924, however,..twenty-one years later..are the official beginnings of aviation education in the public schools of the United States recorded. In the schools of Pennsylvania:[1]

> ...beginnings are recorded as early as 1924, though it is likely that aviation had been included in several vocational courses before that time. The 1930 report of a committee working under the auspices of the Daniel Guggenheim Fund for the Promotion of Aeronautics listed sixteen school systems of Pennsylvania as giving aeronautical instruction in some form or other. Aviation courses of a technical nature were offered by a few Pennsylvania colleges in the 1920's and in at least one university, aeronautical engineering became a regular four-year course before 1930. During the years before our entrance into World War II, scattered classes in Air Commerce, Air Navigation, Meteorology for Aviation, and the like appeared in college curriculums in answer to increasing general interest, but special courses for the training of special public school teachers in aviation did not appear until 1942.
>
> In Congress, motions proposing the teaching of aviation in the nation's public schools had been made sporadically since 1934, but it was not until 1939 that public concern for aviation education first made its demands effective nationally. Then it was the outbreak of World War II and the events immediately prior to it that focussed attention upon education's role in the national security.

The beginnings of aviation education throughout the public schools of the nation in general are recorded in 1927,[2] with national trends closely

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[1] Pennsylvania Committee on Aviation Education, Aviation Education in Pennsylvania Schools, Commonwealth of Pennsylvania, Department of Public Instruction, Harrisburg, 1944, p. 2.

[2] Brown, W.C., "A Future for Aviation Education", School Life,30, 7: 12, April, 1948.

following those of Pennsylvania. Prior to the recorded beginnings of aviation education, it is reasonable to assume, also, that school activities such as model plane construction, airplane clubs, trips and the like existed in many school systems, independent of state or federal control or supervision.

The Civil Pilot Training Program, a federal project under the auspices of the Civil Aeronautics Administration, was instituted in 1939 in cooperation with colleges, universities, and private airport operators.[1] This program gave way to the War Training Service, still under the Civil Aeronautics Administration, during World War II, which latter program was terminated in July 1944 when the need for it no longer existed.

During the 1942-1943 school term, more than 8,500 boys and girls were enrolled in aeronautics courses in the high schools of Pennsylvania, with many more benefitting from new or enriched aviation materials incorporated into existing courses.[2]

As of May 1945, fifteen states had decided to prepare their youngsters for the Air Age, including work as elementary as the spelling of aeronautical terms and as involved as study of the social and economic implications of the Air Age.[3] By this time comprehensive peacetime aviation courses were being offered by at least 240 United States colleges and universities, were being planned by at least 80 more; some 300,000 students, thanks to the Civil Aeronautics Administration, had already received a year's training; and the Army Air Forces were cooperating by sending eight demonstration

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[1] Pennsylvania Committee on Aviation Education, op. cit., p. 3.

[2] Ibid, p. 6.

[3] "For the Air Age", Time, 45:68, May 14, 1945.

teams and vans full of aviation equipment on a three-month tour of schools in 103 United States cities.

By January, 1946, between five and six million persons had become airminded through flight or ground service in the Army, Navy, or Marines; about ninety-six per cent of colleges and universities in the United States had recognized aeronautics as an elective science; at least 399 of the higher educational institutions already had, or contemplated having work in aviation or related fields; over thirty-eight million dollars' worth of aviation equipment had been turned over to non-profit schools throughout the country by the War Surplus Board since October 1944, with more to be made available; and half of the pupils in 28,000 American secondary schools had access to aviation instruction,[1] using the Air-Age Education series (MacMillan Company)[2] as a text.

In the field of librarian-training, cognizance had also been taken of the importance of the Air-Age;[3] and even the little "one-room schoolhouse",[4] now air-conscious, had instituted "familiarization" flights for students.

Thirty states had comprehensive aviation education programs by January, 1948. By this time there was the highest level of interest in aviation education since 1942 when most pre-induction aviation courses were started. Also, by this time, some three thousand schools had acquired..practically free..millions of dollars' worth of wartime aircraft and equipment.[5]

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[1] "Air Education Shows Rapid Advances in All Branches," Scientific American, 174:19, January, 1946.

[2] For a list of the books in this series see appendix.

[3] "Books Have Wings", Library Journal, 71:165-6, February, 1946

[4] Teacher: Mrs. Katherine French; place: Tilton, New Hampshire

[5] Aviation Education News", School Life, 30,4:24, January, 1948.

Teacher-training workshops and institutes also grew in size and number, keeping in step with the increase in aviation emphasis in the country. According to the Office of Aviation Training of the Civil Aeronautics Administration, there were seventy-three summer Air Age institutes and workshops offered in thirty-eight states and attended by 12,428 teachers in 1947, compared to the 1946 figures of twenty-six workshops in eleven states attended by 3,156 teachers.[1] Aviation education had unquestionably progressed rapidly in the years from 1924 to 1948.

The Time Lag Between Aviation Advances and Education

Considering the great strides made in both the aviation industry and aviation education in the United States since 1903, it is a constant source of disappointment to leaders in both fields that an extensive nation-wide program of flight experiences for school children has not yet been adopted. Obviously, a lag between technological advances in aviation on the one hand and education on the other has existed from 1903 to the present.

A report to Congress by the United States Commissioner of Education in 1941 stated that public education had not kept pace with the rapid development of aviation up to that date;[2] and, in 1946, a report[3] to the World Congress on Air Education..one of several reports to that congress bemoaning the existence of a lag in aviation education..mentioned that, "Children in our era, familiar with modern developments of their day, are offered antiquated photos that look simply silly to them." In summing up

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[1] Loc. cit.

[2] Pennsylvania Committee on Aviation Education, op. cit. p. 3.

[3] Johnston, S.P. "Breaking Through", World Congress on Air Education, (Air-Age Education Research), 1946, p. 34.

the situation, the Superintendent of Schools for Philadelphia[1] stated, "I submit for your consideration that there is no institution that is muffing its chance to do such a glorious job as much as the public schools are muffing it today."

Comparing the situation which confronts national aviation education today with that which confronted that nation when its schools ignored the educational potentialities of both radio and motion pictures, one explanation was given as follows:[2] "It is the natural tendency of the mind of man not to use these gadgets if it involves too much effort, or changing his ways of thinking and living, or changing the principles under which he has lived..".

Educational inertia, however, is but one of many factors which have contributed to the lag between aviation and education. Others include: the need for adequate teacher training; the need of state or federal financial assistance; the lack of teaching materials, the inflexibility of school programs; conflicting educational theories; vested academic interests; failure to recognize the social implications of aviation advances; failure to become cognizant of the power of education in solving social problems; and the time lag in the publishing of up-to-date text-books. [3,4,5,6,7]

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[1] Stoddard, A.J., "Down to Business", ibid, p. 60.

[2] Loc. cit.

[3] Parsons, R.T.,"Education Faces the Air Age", Education, 64,10:595, June, 1944.

[4] Pennsylvania Committee on Aviation Education, op. cit., p. 6.

[5] Fuller, E.S., "Aviation in the Schools: an Evaluation", Air Age Aviation News, 3, 3, January, 1946

[6] Bruner, H. B.,"Short Perspective", World Congress on Air Education, p. 59.

[7] Johnston, S.P., loc. cit.

The solution lies not in "...adopting an attitude, a state of mind..."[1] It lies in a recognition that, "Whether we welcome the airplane for its peacetime uses or fear it because of its possibilities for destruction, we are living in the beginning of the Air Age. All of us must be educated to live in it and to think with air minds.[2] Our educators are left, it seems, with two alternatives:[3] either the development, by education, of attitudes resulting in the peaceful use of the air; or the eventual succumbing by educational apathy to the use of the air for military purposes.

Aviation Education as a Part of General Education

The development, through aviation education, of attitudes favorable to the peaceful use of air, cannot be attained by courses directed towards aviation technology *per se* or by units which merely emphasize aviation in terms of physical principles, concepts, and the like. Only by school-work aimed at enriching the understanding of all;[4] work stressing the social, economic and political aspects of Air Age growth;[5] work integrated not with science alone but with the social studies, English, and art areas as well;[6]

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[1] Anderson, G.L., "The Congress Speaks", *World Congress on Air Education*, p. 55.

[2] "We Are Living in the Air Age", *Building America*, 13:254, April, 1948.

[3] Engelhardt, N.L.Jr., "Education for the Air Age", *Education*, 64, 10:585, June, 1944.

[4] Aviation Education and Flight Experience", editorial comment, *School Review*, 53:197, April, 1945.

[5] Engelhardt, N.L. Jr., *loc. cit.*

[6] Givens, W.E., "Air Lanes and Education", *Education*, 64, 10:590, June, 1944.

and work emphasizing the breakdown of national barriers politically, economically, and socially,[1] can such attitudes be developed.

The places in school curricula in which aviation education geared for general education may be offered are:[2] (1) in regularly scheduled courses already in existence; (2) in vocational training or shopwork related particularly to aeronautics; and (3) in a special course, with perhaps flight experience included. Many schools cannot, or will not, offer all three; but a minimum[3] applicable and essential to all secondary schools (and adaptable to elementary schools) should include: (1) an awareness on the part of administrators, of the need for modernizing school curricula to include aviation materials; (2) the maintenance of one or more extra-curricular aviation or model aircraft clubs; (3) integration of aviation materials in appropriate places in the social studies and science courses; and (4) utilization of the abundant resources for aviation education (i.e. books, the government, airlines, agencies connected with the aviation industry, etc.).

The value of a special one year course in aviation..with emphasis upon general education..is accepted[4] by educators today. Yet many schools which had introduced such a course..under the title, "preflight aeronautics" ..to meet the pre-induction needs of students during World War II discontinued it as having served its purpose rather than modernizing and modifying it to meet the post-war needs of student bodies.[5]

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[1] Fuller, E.S., loc. cit.

[2] "Aviation Education and Flight Experiences", op. cit., p. 196.

[3] Brown, W.C., op. cit., p. 15.

[4] Pennsylvania Committee on Aviation Education, op. cit., p. 9.

[5] Brown, W.C., op. cit., p. 13.

One valid criticism of the "special course", written in 1945, states:[1]

> If its purpose is to provide a general background for aviation vocations, should there be as much emphasis on technical aspects of aerodynamics, meteorology, and navigation as is now customary? If its purpose is to provide a richer understanding of the influence and potentialities of the airplane for all students regardless of their future participation in aviation, should not the emphasis on content be quite different? The course as it is now organized is still dominated by the program originally formulated for the training of commercial pilots. More analysis of the objectives to assure their appropriateness for "general education in modern science" will suggest a re-alignment of emphasis.

Since 1945, there has been a "re-alignment of emphasis" in some schools, in both classwork and flight experience. In the latter instance, flight experience has been changed so as to include, in addition to regular flight instruction, excursion flights of the "classroom of the air" or "flying class" variety.

Flight Experience in Public School and College

Flight experience integrated with public school work before World War II was, as mentioned *supra*, flight instruction as laboratory work in the "science of aeronautics" courses offered extensively throughout the country.[2,3,4] This experience was intended to help students achieve

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[1] Aiken, M.L., "Educational Implications of the Air Age", *Curriculum Laboratory Bulletin #10*, Connecticut State Department of Education, September, 1944.

[2] "Aviation Education and Flight Experience", *loc. cit.*

[3] "Air Education", *Life*, 19:69, August 20, 1945.

[4] "For the Air Age", *loc. cit.*

minimum flying skills in some cases, was aimed at giving them an opportunity to experience practical applications of the principles studied in class in others.[1] The various states paid half the cost of flights at eight dollars per hour.

During the war, Preflight Aeronautics for Secondary Schools was recommended by a committee representing the United States Army Air Forces, Naval Aviation, the Office of Education, and the Civil Aeronautics Administration.[2] "Undoubtedly aviation education was advanced by this war emphasis, but aviation for general education was thereby diverted toward a pattern which was not so well suited to the needs and interests of all youth."

After the war, a new era in secondary education began on May 8, 1946, when a group of sixteen pupils from Classen Senior High School, Oklahoma City, participated in the first educational flying excursion of its kind,[3] going from the Oklahoma City airport to Dallas, Texas.

This was the first pupil "classroom in the air", a project made possible by recognition that certain general education phases of work integrated with the Air Age could better be taught..with the airplane itself as a means of transportation..by teachers who were experts in subject areas other than science or, more particularly, aeronautics. A correlation of aviation materials was made with the basic subject areas in school

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[1] Pennsylvania Committee on Aviation Education, op.cit., p. 11

[2] Brown, W.C., loc. cit.

[3] Taylor, W.H., "Classroom in the Air", World Congress on Air Education, p. 50.

curricula (i.e. social studies, science, math, English, languages, art, physical education). Some courses were either revised or implimented with aviation materials. Others..those which were considered outmoded..were discarded.

Successful operation of "flying classrooms" on a college level has been reported by the University of Illinois.[1,2] According to Leslie A. Bryan of the Institute of Aeronautics at the University, not only can they be used for observation flights..such as the geology tours actually taken.. but they can be utilized by the economics and commerce students to take them to large industrial areas to study factory management and business economics in action, as well as by history classes to visit museums, libraries, and historical shrines too far away to be reached by bus or train within a short time.

"Flying classes" have been conducted over New York City and other cities, have flown from New York to Washington, D.C., have observed first-hand the ravages of forest fires, and are either contemplated or have already been completed to such places as Detroit, Lake Success, Europe and Mexico.[3]

Air-Age Education Research, an organization sponsored by American Airlines, has pioneered in this field of group air travel. An article

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[1] "Education Classes in the Air", School and Society, 66:261, October 4, 1947.

[2] Noted in the Christian Science Monitor, Magazine Section, October 9, 1948.

[3] An interview with Miss Evelyn Savidge of Air-Age Education Research, December 27, 1948.

summarizing its functions states:[1]

> For five years, Air-Age Education Research has been proving the tremendous value of guided air travel. Its staff have worked with teachers in the classroom and in the air, developing a comprehensive program enabling students to gain maximum benefits. Now this service is offered to schools and colleges wishing to make travel experience a part of the regular curriculum.
>
> The program includes: preliminary planning with the teacher and school administrator; securing necessary classroom teaching aids; planning flights to meet the particular needs of each group; providing an expert in the field of air transportation to assist in organizing the trip; suggesting methods of financing; touring the airport before the trip.

The Value of the "Flying Class"

The idea of a "flying class"..not to learn about the handling of airplane controls or to recognize the applications of physical principles to flight, but as a means of gaining an appreciation of aviation in our lives while at the same time completing an educational objective correlated with regular school subject-areas..is educationally sound.[2]

As for its true value educationally, conflicting opinions are found. Those who endorse "flying classes" stress (1) the help given in learning about aviation and its importance in our lives,[3] and (2) the value of real, purposeful experiences planned to meet an educational need and conducted by means of air travel.[4,5]

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[1] Advertisement, Journal of the National Educational Association, October, 1948.

[2] "Aviation Education and Flight Experience", loc. cit.

[3] Brown, W.C., loc. cit.

[4] "Educators Evaluate Flying Classrooms", Air Age Education News, 6, 2:3, December, 1948.

[5] "Evaluation of A.A.S.A. Flying Classroom, (mimeographed booklet), Michigan State College and Air Age Education Research.

Teachers who have taken their classes on such trips have attempted to evaluate objectively the success of their flights; but their decisions as to the actual value of the "flying class" educationally are for the most part confidential. Because much of the available favorable evaluation comes from school administrators..participants in the "flying classrooms" trip conducted jointly by Michigan State College and Air-Age Education Research.. and from teachers who had participated in Air Operations Institutes for fellow-teachers rather than for school classes, a careful evaluative study of student flight experiences is called for. Such a study is now being conducted[1], although it had been suggested at least as far back as 1945.[2]

Some Issues Raised by the "Flying Class"

It is the object of this study to determine the feasibility of "flying classes" as judged by the replies of Massachusetts superintendents of schools. Admittedly, in many instances any final decision on student flights would rest with local school committees rather than superintendents. Nevertheless, if in Massachusetts..where no state encouragement of student flight experience is found[3]..superintendents should favor student flights, it is assumed that their opinions would in large measure reflect those of a considerable number of school committees. It is also assumed that their opinions would reflect those of a representative number of school superintendents throughout the United States.

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[1] By Dr. Gordon Blackwell, Director of Research, University of North Carolina.

[2] "Aviation Education and Flight Experience", loc. cit.

[3] Interviews with Mr. A. Russell Mack, Superintendent of Secondary Education, and Miss Alice Beal, Superintendent Elementary Education, Massachusetts Department of Education.

It is impossible, however, to divorce from the problem of superintendent approval such related problems as (1) the actual advantages of air travel, (2) the expense of air travel, (3) safety in the air, (4) passenger insurance, (5) teacher liability, and (6) parental consent. These will be briefly commented upon at this time.

The advantages of air travel: Estimated times of travel by ship and rail in 1907, compared with airplane travel in 1948, as found in Table I,[1] graphically show the strides that have been made by the aviation industry in overcoming distance as a barrier to travel.

Table I: Comparative Travel Times, Ship-Rail v. Plane

Trip origins and destinations	1903[a] Hours	1948[a] Hours
New York City to London	132	11.5
New York City to Moscow	180	15.5
San Francisco to Tokyo	204	16.5

[a] Comparison of estimated times of travel, point by point, i.e. usual route distances divided by the best speed for 1903 and 1948

According to Wayne W. Parrish[2], "When people can go places faster and more comfortably, they do so more often." N.L. Engelhardt, Jr., said,[3] "The potential impacts of aviation on civilization can only be comprehended in the light of these two basic contributions, speed and accessibility."

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[1] Brown, W.C., loc. cit.

[2] Parrish, W.W., " Trade Routes in the Sky", World Congress on Air Education, p. 5.

[3] Engelhardt, N.L., Jr., Education for the Air Age, (MacMillan Co.), New York, 1942, p.9.

An emphasis upon speed and accessibility as the two main advantages of air travel is further attested to by Stoddard.[1]

According to a recent study[2] made for the Association of American Railroad..with a sample of 2,583 respondents 282 of whom had recently used airline transportation..replies to the question, "What do you like best about plane travel?", listed in addition to "speed": "comfort"; "cleanliness"; "better service"; "more enjoyable"; "convenience"; "scenery"; and "free meals".

The expense of air travel: During the past eighteen years, air passenger fares have been steadily lowered, as the following table shows:[3]

Table II: Reduction in Passenger Fares

Average fare/passenger mile	date
about $0.12	January 1929
" 0.08 1/2	" 1930
" 0.06 3/4	" 1931
" 0.06	" 1932
" 0.05 3/4	" 1935
" 0.05	" 1940
" 0.06	" 1949 [a]

[a] not in original table

In fact, in some cases airplane rates in the past few years have been at times even lower than combined first-class train, plus lower Pullman

[1] Stoddard, A.J., loc. cit.

[2] "Survey Shows Slight Decline in Enthusiasm for Air Travel", Aviation Week, 47:59, September 8, 1947.

[3] Wheatley, W.A., ed., Teacher's Manual of Aviation Aids, United Air Lines, 1940.

berth, charges[1]. Some comparative train and plane charges for 1945, which illustrate that fact, follow[2]:

Table III: Comparative Plane and Train Charges for 1945

Trip origins and destinations	Plane fare	Train, plus lower berth, fare
New York to Los Angeles	$119.10	$124.72
New York to Chicago	33.65	36.93
Chicago to Kansas City	18.85	18.66
Miami to New York	56.65	56.84
Denver to Washington	69.55	73.37

Some of the factors which tend to lower air rates are: (1) the free air through which planes travel; (2) the absence of a funded debt in the financial structure of any airline in the United States[3]; and (3) the competition of airlines with ship, train, and bus services.

The present rates charged by American[4] and Eastern[5] Air Lines are approximately $0.06 per passenger mile for individual flights, and $0.045 per passenger mile for group flights. A fare, eventually, of $0.03 per passenger mile..with special rates below that figure based on a "deferred

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[1] Engelhardt, N.L., Jr., op. cit., p. 31.

[2] "Air Fare v. Rail", Business Week, September 1, 1945, p. 46.

[3] Stuart, J., Wings Over America, (Public Affairs Pamphlet No. 14), Public Affairs Committee, Inc. 1946.

[4] Letter from Air-Age Education Research (see appendix)

[5] Conversation held with a representative of Eastern Air Lines, in answer to letter sent to Captain Rickenbacker (see appendix)

passenger" basis which uses a portion of unsold accommodations normally available..is the desired goal[1].

At present it is extremely difficult to obtain special student rates from the large airlines[2]. However, a Civil Aeronautics Board hearing on the matter was pending as of December 27, 1948[3]. Until special rates are established and conveniently accessible to all school systems, financial assistance will be needed from private sources, local school boards, state and federal sources.

Safety in the air: According to one author[4], "The development of safety features (in aviation) has shown remarkable progress." The extent of that progress can be seen in Table IV[5], which lists comparative passenger fatalities per 100,000,000 passenger miles for automobile, bus, train, and airplane travel in the twelve-year period from 1936 to 1947.

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[1] Van Zandt, J.P., "Rock-Bottom Fares", World Congress on Air Education, p. 47.

[2] ...although Eastern Air Lines, for one, makes available the facilities of New-Type Constellation planes for use at teacher institutes.

[3] According to Mr. James V. Bernardo

[4] Engelhardt, N.L., Jr., op. cit., p. 17.

[5] Mr. Ben Stern, Office of Aviation Information and Statistics, Civil Aeronautics Administration, Washington, D.C. (for correspondence, see appendix).

Table IV: Comparative Accident Data 1936--1947
(Passenger fatalities per 100,000,000 passenger miles)

CALENDAR YEAR	Passenger automobiles and taxis	Buses	Railroad passenger trains	Domestic Scheduled air transport planes	Privately operated planes
1936	4.5	(a)	0.09	10.0	162.2
1937	4.7	(a)	0.09	8.3	156.2
1938	3.9	(a)	0.36	4.5	120.2
1939	3.7	(a)	0.14	1.2	54.6
1940	3.5	(a)	0.34	3.0	94.8
1941	4.0	0.24	0.14	2.3	(b)
1942	2.7	0.23	0.17	3.7	(b)
1943	2.7	0.22	0.31	1.3	(b)
1944	2.9	0.22	0.26	2.2	(b)
1945	2.9	0.17	0.16	2.2	(b)
1946	2.5	0.19	0.18	1.2	(b)
1947	2.3	0.21	0.16	3.2	(b)

[a] Included with passenger automobiles and taxis prior to 1941. [b] Not available. Source: Domestic Scheduled Air Transport: 1936 and 1937--Civil Aeronautics Administration. 1938-47 SAFETY BUREAU, Civil Aeronautics Board. All others--"ACCIDENT FACTS," National Safety Council, Inc.

That room for improvement still exists, however, is also apparent from the figures presented in Table IV. The Aeronautics Safety Board has therefore suggested[1] that airlines spend more funds on research and development, firecontrol, morale, and maintenance in an effort to improve safety conditions.

As for discretion in school use of aviation facilities, "An introduction into the realities of the air age (with respect to safety, liability,

[1] "For Safer Flying", Business Week, January 10, 1948, p. 38.

etc.) is particularly needed for the school administrators, teachers, and school board members"[1].

Passenger insurance: The increasing ease of access to air-insurance passenger policies can be seen from the fact that in 1935 only short flights were accepted as standard risks; by 1940 three United States insurance companies accepted Western Hemisphere and one accepted trans-oceanic flights; and by 1947, two-thirds of one hundred life insurance companies..80 per cent of all life insurance companies in the United States ..accepted regularly-scheduled Western Hemisphere flights, while one-half accepted world-wide flights, as standard risks[2].

The expense of insurance policies issued by Associated Aviation Underwriters is negligible, coming to.."twenty-five cents for all one-way passages towards an ultimate destination within a seven-day period"[3]. Policies issued by such companies as Continental and United States Aviation Underwriters are comparable to this, though higher. As for student rates, in the past, schools have arranged for group insurance "at a very low rate"[4].

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[1] Parsons, R.T., loc. cit.

[2] "Standard Insurance Now Common in Air Travel", Business Week, May 31, 1947, p. 76.

[3] "Air Insurance: Passenger Policies", Business Week, August 4, 1945, p. 46.

[4] Letter from Mr. Kenneth Newland of Air-Age Education Research, (see appendix).

Teacher liability: The following details[1] on "airport laboratory" liability will serve to highlight some of the legal aspects of teacher liability for accidents occuring in the course of a "flying class".

> Although the public schools are not liable for injuries to students, their immunity does not extend to teachers as individuals. Students should therefore be protected through insurance, which is easily obtained at relatively small cost.
>
> School authorities should satisfy themselves that the flight operator selected possesses the best facilities, flight equipment and personnel locally available. The School Committee should investigate the local flight operators and their operational records. Upon the selection of a good flight operation may depend the ultimate success of the flight experience program. The following recommendations should be considered:
>
> 1. ----------
>
> 2. The flight operator shall maintain adequate insurance covering public liability, property damage, and personal injuries to the student.
>
> 3. The flight operator should provide a minimum number and quality of...mechanics, airplanes and other equipment to insure safe flying in accordance with accepted practices.
>
> 4. The flight operator should refuse further flight experience to students when they become hazards to persons or property.
>
> The contract provisions suggested above should adequately protect the school or sponsoring agency and prohibit the shifting of responsibility for negligence on the part of the flight instructor, or flight operator , to the school district or sponsoring agency. The assumption of costs of liability protection by the flight operator is traditional, as he is operating a private enterprise for profit. He is not entitled in any event to the legal immunity accorded schools in relation to their governmental activities.

Some schools have followed a suggestion that pupils go to airports on a volunteer basis..i.e. "on their own"..after school hours, as one means of removing the threat of teacher liability in case of accidents. Such a practice, however, would be impractical if a long flight were contemplated.

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[1] An Airport Laboratory Plan for Students in Secondary Schools and Colleges, United States Department of Commerce, Civil Aeronautics Administration, Office of Aviation Training, May 1947, pp. 27-29.

Besides, even that practice has not been a successful answer to the threat of teacher liability for pupil accidents according to the latest test cases in the law courts of the various states[1].

Parental consent: Students who wish to participate in flight experiences of any kind must have the written consent of their parents or guardians[2], although such consent still does not eliminate the threat of teacher liability. As consent by parents hinges upon the probable safety of their children, the Civil Aeronautics Administration will recognize and certify only those flyers and airports which meet rigorous standards. In addition, no flights are sanctioned until equipment is preliminarily checked and weather conditions are favorable.[1]

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[1] Interview with Mr. Bernardo.

[2] Pennsylvania Committee on Aviation Education, op. cit. p. 12.

CHAPTER III

THE QUESTIONNAIRE

The Need for a Questionnaire

There were several factors which contributed to the selection of a questionnaire as the instrument with which to gather the information essential to the success of this study.

1 There are no available studies on the extent of integration between the fields of aviation and education in Massachusetts or, for that matter, in any state prior to 1945. And, even if such studies were available, they would by no means be representative of current practices unless conducted within the past two years.

2 The Massachusetts Department of Education, the only other possible source of information regarding practices in aviation education in the state, neither dictates state educational policy curriculum-wise nor has at its disposal information on the subject.

3 Questionnaires sent to all Massachusetts school superintendents from a practical standpoint are more economical, less time consuming, and of greater value in obtaining widespread representative opinions than are isolated interviews with a mere sampling of superintendents.

A questionnaire on aviation education in the public schools was therefore constructed.

Purposes of the Questionnaire

The questionnaire which was finally sent out was designed to ascertain the following:

1. current practices in aviation education in the elementary and secondary schools of Massachusetts;
2. the extent of integration between aviation and education in Massachusetts public schools;
3. the educational areas which emphasize and those which ignore the possibilities of aviation education, within the framework of school curricula;
4. the correlation between the presence and size of airports in various communities on the one hand and interest in aviation in the schools on the other;
5. the correlation between the size of communities..as indicated by school populations..and interest in aviation;
6. the intensity of interest in air education as shown by field trips taken by public school classes to airports;
7. the extent of school-sponsored or school-integrated flights;
8. the means by which past educational flights were sponsored;
9. the extent of parental interest and cooperation in educational flights;
10. the conditions under which flights by student classes would be considered by school superintendents;
11. the possibility of making any generalizations about "flying classes" from the intensity of interest shown by Massachusetts school superintendents.

The Sample

Questionnaires were mailed to 210 of the 211 school superintendents

listed by the Massachusetts Department of Education.[1] Of those who received questionnaires, 144 represented individual cities and towns while the remaining 66 represented superintendency unions (i.e. groups of towns with but one superintendent) embracing 206 additional towns. In all, therefore, 350 of the 351 communities listed by the Department of Education were included in the study.

The questionnaires were sent out on February 23, 1949, with return-addressed stamped envelopes enclosed. The following letter of explanation accompanied each questionnaire:

School of Education
Boston University
84 Exeter Street
Boston, Massachusetts

Dear Sir:

My purpose in sending you the enclosed questionnaire is to ascertain current practices in "Education for the Air Age" in Massachusetts. Only with your assistance, and the assistance of superintendents in other communities throughout Massachusetts, can I gather the data needed for a comprehensive picture of the importance placed upon aviation in the schools of this state.

Immediately preceding and during World War II, demands were made upon the schools of the United States to prepare young men for service in our armed forces. In answer to these demands, units in aviation were offered within the framework of existing courses. In many cases even special pre-flight aeronautics courses were introduced into school curricula. (The records made by our pilots and the personnel behind them attest to the success of our schools in this respect.)

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[1] Educational Directory, Bulletin of the Department of Education, the Commonwealth of Massachusetts, 1948.

With the end of formal hostilities the demand for qualified applicants for aviation training slackened enormously. Many schools, their jobs aviationwise presumably done, discarded their war-imposed innovations. However, the necessity of providing adequate preparation for the Air Age in which we now find ourselves has prompted many school systems to continue their work with aviation. The enclosed questionnaire was developed to determine exactly to what extent aviation is now included in school curricula in Massachusetts.

A stamped, return-address envelope is enclosed for your convenience.

Sincerely,

Melvin Silberberg
Graduate School
Boston University

It was hoped that the timeliness of the questionnaire, anonymity of replies, enclosed envelopes, and the prestige value of the return address.. in care of Professor John G. Read, the School of Education, Boston University.., would all be factors tending to increase the number of returns.

The Questionnaire

Questions #1-4: Questions #1 - 4 of the questionnaire,[1] which ask for "the number of schools (elementary and secondary) in your community (or superintendency)", and "the approximate total enrollment (elementary and secondary)" were included to indicate the size of communities from which individual replies came. Thus it would be possible, once all replies had been received, to establish the correlation between community size on the one hand and such things as interest in aviation, past participation in field trips and flights, and possible participation in future flights on the other.

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[1] See pp.30 -30, for the text of the questionnaire.

QUESTIONNAIRE ON AVIATION EDUCATION IN
THE PUBLIC SCHOOLS OF MASSACHUSETTS

1. ... The number of elementary schools in your community (or superintendency)

2. ... Approximate total enrollment

3. ... The number of secondary schools in your community (or superintendency)

4. ... Approximate total enrollment

On the elementary level (grades 1 - 6) in your community:

5. Is work in the social studies integrated, or "tied in", with aviation?
   ( ) Yes (check)
   ( ) No

6. Is work in the science area integrated with aviation?
   ( ) Yes
   ( ) No

7. Is any other work on the elementary level integrated with aviation?
   ( ) Mathematics
   ( ) Language
   ( ) Art
   ( ) Other: (qualify).....

On the secondary level (grades 7 - 12 or 14) in your community:

8. Is work on the secondary level integrated with aviation?

   a. Mathematics (check one)
      ( ) extensively
      ( ) fairly often
      ( ) slightly
      ( ) not at all

   b. English (check one)
      ( ) extensively
      ( ) fairly often
      ( ) slightly
      ( ) not at all

   c. Languages (check one)
      ( ) extensively
      ( ) fairly often
      ( ) slightly
      ( ) not at all

   d. Biology (check one)
      ( ) extensively
      ( ) fairly often
      ( ) slightly
      ( ) not at all

e. Physical sciences (check one)
( ) extensively
( ) fairly often
( ) slightly
( ) not at all

f. Other courses tied in with aviation: (qualify)
.....
.....
.....

9. Does your community offer a special one-year course in aviation on the high school level?
( ) Yes
( ) No

10. Is there an airport in, or near, your community?
( ) Yes
( ) No

11. If so, do any of the commercial airlines use the airport?
( ) Yes
( ) No
( ) Don't know

12. Have any classes in your community been taken on field trips to airports in the past five years?
( ) Yes
( ) No
(a) ... The number of such trips, if any, taken by secondary school classes
(b) ... The number of such trips, if any, taken by elementary classes

13. Have <u>any</u> classes been taken on flights in the past five years?
( ) Yes
( ) No
(a)... The approximate number of students taken aloft, if any

14. Would you allow classes, which had first secured parental permission, to participate in an educational group flight.....
(a) if your school system financed the flight at $0.05 (five cents) per passenger-mile?
( ) Yes
( ) No

(b) if parents financed the flight?
( ) Yes
( ) No

(c) if the school raised funds by means of a sports event, play, or the like?
( ) Yes
( ) No

(d) under any circumstances other than those listed above?.....
.....

15. If flights were held in the past, how were they financed?.....
.....

16. If student flights were made, or attempted, what was the extent of parent interest and cooperation?.....
.....

---

17. Which of the following are presented in the elementary grades in your community? (check)

( ) man's desire to fly
( ) how a plane flies
( ) what wind is
( ) communications
( ) the biology of flight
( ) what an airport is
( )weather forecasting
( ) what clouds are
( ) what rain and snow are
( ) aviation and world peace
( ) aviation and national security
( ) community dependence on aviation
( ) development of lighter-than-air craft
( ) development of heavier-than-air craft
( ) the airplane and changing concepts of distance and time

Questions #5-7: These questions, about aviation education on the elementary level (grades 1-6), were inserted in the questionnaire to determine the presence or absence of an integrating factor between elementary education and aviation. Had this section not been included, it would have been impossible, on later analysis of returns, to determine whether a dichotomy existed between aviation education on the elementary and secondary levels.

Question #5, "Is work in the social studies integrated, or 'tied in' with aviation was intended as a check on whether children in grades 1 through 6 were given an understanding of "how aviation affects the lives of people and (of) the government regulations necessary to the common welfare in an air age".[1]

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[1] Storm, G.E. "Aviation and Education", Elementary School Journal, 46: 188, December 1945.

Question #6, "Is work in the science area integrated with aviation?", was meant to ascertain whether there was any incorporation of aviation material whatsoever in the elementary grades of the various communities which replied. It was assumed at the outset that work in the science area would correlate most highly, of all the areas in school curricula, with aviation education. Question #6 was intended both to justify that assumption and to serve as a basis of comparison in finding out the extent of elementary school aviation integration with work in mathematics, art, language, the social studies, and other subject areas.

"Is any other work on the elementary level integrated with aviation?", question #7, was intended..as explained supra..as a measure of the extensiveness of inclusion of aviation materials throughout the subject areas in elementary schools. It was felt that widespread interest in aviation in elementary school would correlate highly with interest in "flying classes". Therefore questions #5 through 7, particularly the latter, were intended to establish the existence--or non-existence..of such a correlation.

Questions #8, 9: The question, "Is work on the secondary level integrated with aviation?", intended to determine the extent of aviation integration in grades 7 through 12 or 14, was so constructed as to measure not only the spread of integration according to subject areas but also the intensity of emphasis within each major area. As for, "Does your community offer a special one-year course in aviation on the high school level?", this was included as a check on whether such a course..one recommended for its value to general education..was considered by superintendents of sufficient merit to be continued, in modified form, rather than for its war time

value to the aviation branches of our Armed Forces.

Questions #10, 11: The question, "Is there an airport in, or near, your community?", was included to ascertain the importance of aviation in the immediate environment of the pupils in the various replying communities. To a certain extent, also, it was to become an indicator of the importance placed upon the role of aviation by individual communities. For, any community..without ready access to an airport..which emphasized field trips to airports and/or flights as a part of school-directed student experiences would undoubtedly stress the implications of the Air Age in its schools. Question #11, "If so do any commercial airlines use the airport?" was asked to ascertain size of local airports as well as the convenience with which "flying classes" might originate from them.

Questions #12-16: These questions are the "heart" of the questionnaire in that they ask for information related to actual, or conceivable, first-hand aviation experiences by students. Questions #12 and 13 which ask for the extent of field trips to, and flights from, airports by student groups within the past five years, were meant as discriminating items to separate school systems which were integrated with aviation solely by classroom experiences from those which went further by providing an opportunity for direct purposeful experiences, i.e. the examination of airplanes and airports, as well as actual flight experience. A time element of five years was mentioned as being the approximate time during which schools had de-emphasized their war-instituted curricular changes. As for question #13 in particular, "Have any classes been taken on flights in the past five years?", upon the answers to it would depend a judgment as to the feasibility of "flying classes" based upon past participation in

comparable flights.

Question #14, which asked for the conditions..if any..under which school superintendents would allow student flights, is comparable to question #13 in that upon the answers to it also hinges the feasibility of "flying classes", if expressed present interest and willingness to participate are any criteria of future interest and participation.

Question #15 asks, "If flights were held in the past, how were they financed?". The realization that the problem of finances plays an essential role in any administrative decision concerning student flights, as well as the desire to see how school systems throughout Massachusetts had coped with the problem of aviation finances prompted the question. Another factor influencing the inclusion of question #15 was a desire to compare actual means of financing flights with a list provided by Air-Age Educational Research.[1]

"If student flights were made, or attempted, what was the extent of parent interest and cooperation?" Question #16, subject matter for a thesis in itself, could by no means be adequately considered by one question directed not to parents but to superintendents in their stead. Yet no consideration of the feasibility of student flights would be valid without some mention of parental opinions. Therefore the question was included, with replies to it to be interpreted in the light of their source.

Question #17: The last question in the questionnaire, which includes a check-list of aviation material suitable for the elementary grades, was intended to serve as a measure of the relative emphasis placed upon

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[1] Mimeographed brochure, "Organization of an Air Travel Project", Air-Age Education Research, pp. 4-5.

aviation materials in the science and social studies areas in grades 1 through 6. Of the twelve items listed, several might be presented as either science or social studies material; but the majority were very easily classified as either science or social studies. A comparison of the number of science and social studies items would thus be possible, as would a comparison of results of question #17 with results of questions #5 and 6.

Returns

The use of the questionnaire-type of survey to elicit information is admittedly to be discouraged if other means of obtaining said information..e.g. research into the literature, or interviews..are available. In this particular instance, however, a questionnaire was chosen as the research instrument, constructed, and mailed on February 23.

First replies were received as early as February 26, three days after the questionnaires were sent. By March 24..approximately one month after the mailing, the last replies had for all practical purposes been received. In all, 117 replies..constituting 55.8 per cent of the 210 questionnaires sent out..had been received from as many Massachusetts school superintendents.

CHAPTER IV

RESULTS OF THE SURVEY

Of the 117 questionnaires that were returned by various Massachusetts school superintendents, only three were discarded. These had been left blank for the following reasons:

1 "No unusual emphasis on aviation, except as found in all regular school textbooks";

2 "The course (?) was abandoned for lack of interest";

3 "No high school; the study of aviation only incidental".

The results of the organization of the remaining 114 questionnaires follows. A general information table summarizing these results is included in the appendix.

Face Data

Questions #1-4: The 114 completed questionnaires were from superintendents in charge of 982 elementary and 221 secondary schools with a combined enrollment of approximately 354,000. An examination of questions #1-4 showed, as expected, that the total number of public schools..elementary and secondary combined..in a community[1] did not necessarily bear any relationship to the size of the school population that community. For example, one superintendent in charge of ten schools represented a total pupil enrollment of 3200 while another, in charge of the same number of schools, represented a total enrollment of only 580.

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[1] Any subsequent reference to the word "community" will include the concept of an educational community: city, town, or superintendency union.

A discrepency between average and actual school enrollments can also be shown, the more easily on the secondary level (Table V) where pupil enrollment concentrated in as few educational "plants" as possible is a more convenient guide to total school population than either elementary enrollment or elementary and secondary combined.

Table V: Average v. Actual Secondary School Enrollments in 114 Massachusetts Communities

No. secondary schools per community	No. communities	Total enrollment	Average per school	Range per community
0	5	0	0	0
1	66	30,719	465	48-2,000
2	28	28,121	502	185-1,800
3	8	9,734	405	211-3,500
4	3	7,629	635	1200-4,654
5	2	9,881	988	4423-5,458
7	1	3,200	457	3,200
46	1	93,009	2,022	93,009

A comparison between the number of elementary schools per community and total enrollment therein proved even more unreliable. One community containing twenty-eight elementary schools, for example, showed an elementary enrollment of 780, while another with but one elementary school showed a comparable enrollment of 675.

It was decided, therefore, to concentrate attention upon secondary school populations alone in attempting to correlate results of the survey with community sizes. Communities were grouped, according to total secondary enrollment, into three arbitrarily assigned categories. These were:

"small": a secondary enrollment of zero to 250; "medium": an enrollment of 251 to 1,000; and "large": an enrollment of 1,001 and more. On this basis the 114 communities were grouped as follows:

Table VI: Small, Medium, and Large Communities, As Shown By Public Secondary School Enrollments

Range of enrollment per community	No. of communities per group
0 to 250 (small)	30
251 to 1,000(medium)	53
1,001 to -- (large)	31

Any subsequent breakdown of the results of this survey according to the size of the respondent communities will be based upon the above groupings.

On the Elementary Level

Question #5: Seventy-six superintendents said that work in the social studies area was either "integrated, or 'tied in'" with aviation in the elementary schools included in the survey, while thirty-seven said that it was not. One superintendent refused to commit himself on the subject.

Of those who replied in the affirmative, several added qualifying remarks such as "by air routes", "only as aviation is mentioned, with illustrations, in our very excellent textbooks", and, "when it comes in 'naturally'". One superintendent who had answered in the negative commented, "Topics undoubtedly come up which are treated in a discussion."

Grouping of replies according to secondary school population can be seen in Table VII.

5. Table VII: Replies, According to Community Size, to the Question, "Is work in the social studies integrated, or 'tied in' with aviation?"

Groupings according to secondary school populations	Replies	
	Yes	No
Small	24	5
Medium	28	25
Large	24	7

Question #6: Elementary work in the science area was integrated with aviation according to eighty-five superintendents, while twenty-eight said that it was not. One superintendent again refused to reply, while several affirmative replies were qualified by remarks such as"...but very little".

A grouping of replies..according to secondary school population.. follows:

6. Table VIII: Replies, According to Community Size, to the Question, "Is work in the science area integrated with aviation?"

Groupings according to secondary school populations	Replies	
	Yes	No
Small	22	7
Medium	37	17
Large	26	4

Twenty superintendents showed inconsistencies in their replies to questions #5 and 6. Of these, fourteen had science integration rather than social studies integration, while the reverse was true of the remaining six.

Question #7: Thirty-five superintendents signified that mathematics was also integrated with aviation in their elementary schools; twenty-four included "language"; and thirty-seven included "arts". Other elementary work integrated with aviation included: remedial reading, reading, physical education, music, rhythmics, and current events.

An indication of the extensiveness of curriculum inclusion of aviation materials, together with a break-down according to population groups, can be seen from the frequency with which one or more subjects outside of the social studies or science categories were included in elementary school work (Table IX).

7. Table IX: Extensiveness of Inclusion of Aviation Materials in Elementary School Curricula. (Science and Social Studies Excluded)

No. of integrated subjects	Frequency of occurence	Groupings According to Community size		
		Small	Medium	Large
0	47	10	27	10
1	24	5	14	5
2	23	7	7	9
3	9	4	2	3
4	0	0	0	0
5	1	0	0	1
6	1	0	0	1
"incidentally"	9	2	5	2

Nine superintendents indicated that there was incidental inclusion of one or more subjects other than in the science or social studies areas without signifying the specific subjects in question. Several comments were: "only as interest centers" and "no specific program".

On the Secondary Level

Question #8: The range in intensity of integration between aviation and the various offerings in the 109[1] secondary schools included in the study showed either "slight emphasis" or "no emphasis" upon aviation in the biology, mathematics, English, and language classes of a majority of the communities. Only in the physical sciences was aviation integration to be found either "extensively" or "fairly often" in a majority of cases. (Table X).

Table X: Intensity of Integration With Aviation in the Secondary Schools of 109 Massachusetts Communities

Intensity of integration	Courses including aviation materials				
	Mathematics	English	Languages	Biology	Physical sciences
Extensively	2	0	0	2	16
Fairly often	30	11	5	19	60
Slightly	63	68	48	45	21
Not at all	6	15	35	24	3
Qualified	3	3	3	3	3
No answer	5	12	18	16	6

Information volunteered by the various superintendents, showed, in addition, integration in the social studies area (which was to be expected),

[1] Five of the original 114 superintendents had no secondary schools in their communities.

as well as in the following: art, manual arts, general science, aeronautical mathematics, aeronautical and general electricity, mechanics, driver education, guidance, aviation club, geography, health education, applied physics, and elements of aeronautics. One school alone offered work in navigation meteorology, pre-flight aeronautics, airplane service, and airplane mechanics. What few qualified answers there were mentioned that integration was found "wherever there seems any good reason" for it.

Question #9: Only fourteen of the 109 Massachusetts communities with secondary schools still offer special one-year courses in aviation, while ninety-five do not. Fourteen superintendents of the latter qualified their replies to question #9 by stating that such courses had been given but were now discontinued. As a majority of communities had had special aviation courses during the war, it seems worthwhile to include here some of the comments mentioned in defense of the discontinuance of these courses. They are:

1. "We did during the war; now a part of the physics course".

2. "We did during the war and for two years after the war. It was an elective study and enrollment and interest dwindled to almost zero--so we substituted other courses for it".

3. "Did during the war; now combined with applied science".

4. "No longer given. Only three pupils elected it this year".

5. "Eliminated course in aeronautics as of June, 1948".

6. "We did, but insufficient enrollment to continue this year".

7. "During the war; but discontinued it due to lack of demand".

8. "Aviation is integrated with the school curriculum in math, reading, English, and sciences. Aviation is not the primary purpose in education. We are just now getting recognition for adequate instruction in the operation of the motor car".

On the other hand, one of the superintendents who still has a special course in aviation included in the curriculum of his secondary school said, "We are cooperating with the C.A.P. and have approximately thirty-five high school pupils enrolled in a class that meets for two hours once each week."

As seen in Table XI, special courses in aviation tend to be found in larger communities, with none whatsoever found in the "small" communities of the survey.

9. Table XI: No. of Communities With Special Courses in Aviation

Grouping according to population	Total Number of Communities	
	No. with special courses	No. without special courses
Small	0	25[1]
Medium	5	48
Large	9	22

[1] Of the original thirty communities in this group, the five are not counted which have no secondary schools whatsoever.

Actual Field Trips and Flights

Question #10: Eighty-five superintendents said that there was an airport in or near their communities, while twenty-nine said there were none. Of the latter, seven were in the "small" size grouping, eleven in the "medium", and eleven in the "large". In several instances, replies gave information as to the distance, in miles, to the nearest airport rather than whether or not an airport was accessible. In those instances, fifteen miles was considered "near" and any distance greater than that was classified as "far". Inasmuch as the greatest distance mentioned voluntarily by a respondent answering in the affirmative was "15 miles", this step was considered justifiable.

For an analysis of the correlation between community size and the presence of an airport in the communities polled, see Table XII.

Table XII: Community Size v. the Presence of Airports

	Size of Community		
	Small	Medium	Large
No. with airports	20	42	23
No. without airports	10	11	8

Question #11: Of the eighty-five "yes" replies, above, thirty-six said that commercial planes used the airport, forty-four said that they did not, while five did not know. A comparison between the size of communities..judged by secondary school enrollments therein..and the use of existing airport facilities by commercial airlines is in large measure a

comparison of community size and airport size. Such a comparison (Table XIII) shows that large airports are found more frequently in medium-or large-sized communities than in small.

11. Table XIII: Comparison of the Use of Existing Airport Facilities by Commercial Airlines and Community Size

	Groupings According to Population		
No. of accessible airports	Small	Medium	Large
No. used by airlines	7	15	14
No. not used by airlines	9	32	8

Question #12: Fifty-one of the 114 communities had conducted student field trips to airports within the past five years, while fifty-two had not. Ten superintendents could not answer this question, and another said, "Bedford Airport is so close, most of our youngsters are familiar with it."

In all, at least 139 trips were taken. The exact amount is not ascertainable from the data available, several replies having mentioned "many" trips, "occasional" trips, or trips "on special occasions" rather than specific numbers. Others signified that trips had been taken, but did not otherwise signify the number of such trips.

The breakdown of trips taken according to community sizes can be seen in Table XIV.

12. Table XIV: Field Trips Taken v. Size of Communities

	Size of Communities		
No. of communities taking field trips	Small	Medium	Large
	14	18	19

Of the twenty-nine communities which had no airport conveniently accessible, eleven had nevertheless taken classes on field trips.

Question #13: Students from eleven communities had taken flights as part of school activities, while those from ninety-eight other communities had not. In one of the eleven instances in which flights had been conducted, students had gone "on their own"; in another, "Seniors in high school took Eastern to New York; while, in a third, "Eighth-grade classes usually take one trip and flight in Boston, not the local field".

Of the eleven communities which had participated in flights, five were small in size, four were medium and two were large. One participating community had no airport nearby. Ten communities conducted both field trips and flights, while only one conducted flights without field trips.

In all, over 282 pupils in the 114 Massachusetts communities replying had participated in flights, at least four of which had been group flights.

Question #14: In all, seventy four superintendents mentioned at least one circumstance under which pupil flights would be allowed. Fourteen said that they would not allow flights under any circumstances, thirteen

did not answer the question at all, while an additional thirteen gave qualified answers, some of which follow:

1. Not under school auspices. This matter was thrashed out at a School Committee meeting with the owner of the airport. Main arguments against it: if there was an accident the accident would not occur under school sponsorship. This is the viewpoint, I believe, in many Massachusetts communities.

2. Doubtful that parents would approve.

3. Note: this is hardly a fair question. I applaud air traffic but think it is the business of the individual, not of the school.....I always pay for my own and family's flights.

4. That would be up to the School Committee to decide. I, as superintendent of schools, would think twice before I would recommend it.

5. I should not forbid it, but would discourage it. We need lots of things much more than such flights, which individuals can buy for themselves.

6. ...Only after School Committee determined policy.

7. ...But not in school hours.

8. This is a matter which would require School Committee action.

9. ...If responsibility could be taken off of school authorities.

10. Yes, upon approval of the School Committee.

11. No budget funds for extra services at present.

12. Probably release from school time. Legal aspects of liability would have to be investigated.

13. Possibly.

14. If the School Committee also approved.

One of the superintendents who would not consider flights under any circumstances had this to say: "Certain parents would say yes. Certain parents would wish to say no. Children of no parents would say, 'oh, gee--all the rest of the kids in the class can, etc., etc.'. If all parents truly felt yes, then O.K."

Question #14a: "...if your school system financed the flight...": Thirty-six superintendents said they would allow flights financed by their school systems, while forty said that they would not allow flights under such circumstances. Comments included, "Yes..but we would have to get the money"; "little chance of using public funds, though I would approve"; "we have no money for this"; and "be realistic, I couldn't get an appropriation for this purpose".

A breakdown of "yes" and "no" answers according to community size is included in Table XV.

14. Table XV: Distribution of "Yes" and "No" Answers to Question #14a According to Size of Communities

Groupings according to secondary school populations	Replies	
	Yes	No
Small	10	6
Medium	15	30
Large	11	4

Question #14b: "...if parents financed the flight?" Seventy-five superintendents said they would permit flights financed by parents, while fourteen said no. One reply said, "Yes, if they not only financed but took responsibility as well".

A breakdown of "yes" and "no" answers according to community size is to be found in Table XVI.

14. Table XVI: Distribution of Yes and No Answers to Question #14b According to Size of Communities

Groupings according to secondary school populations	Replies	
	Yes	No
Small	21	5
Medium	34	8
Large	20	1

Question #14c: "...if the school raised funds by means of a sports event, play or the like?": Fifteen superintendents said "yes" and sixteen, "no", to the question of flights under school-raised funds. Qualified answers included, "...would not encourage, due to so many other demands", "would discourage", and "doubtful".

A breakdown of "yes" and "no" answers according to community size is found in Table XVII.

14. Table XVII: Distribution of "Yes" and "No" Answers to Question #14c According to Size of Communities

Groupings according to secondary school populations	Replies	
	Yes	No
Small	6	2
Medium	7	8
Large	2	6

Question #14d: "...under any circumstances other than those listed above?": Other suggested circumstances under which flights would be possible were: "raise money from interested citizens": "by service clubs": "C.A.P."; "if all expenses were paid by sponsors of Air Education"; "by invitation of airlines or airports"; and "under any suitable arrangements".

Question #15: The eleven communities which participated in flight experiences mentioned the following as the means by which they had financed their flights: "parents" (2), "pupils" (3), "4-H Club" (1), "interested citizens" (1), "class funds" (1), "free" (3), "athletic association and players" (1), and "service clubs" (1).

Question #16: The replies to the question of parent interest and cooperation ranged from "100 %" and "approved by parents to the fullest" to "none". Intermediate replies were: "some interested, some opposed", "consent", "listed consent", "parents signed", and "good".

Question #17: Of the fifteen items in question #17, six were intended as science items, six as social studies items, and the last three as "neutral" items which might be considered as belonging to either area.

Those items considered as belonging to the social studies area were: "man's desire to fly"; "communications"; "aviation and world peace"; "aviation and national security"; "community dependence upon aviation"; and "the airplane and changing concepts of distance and time".

Science items included "how a plane flies";"what wind is"; "the biology of flight"; "weather forecasting"; "what clouds are"; and "what rain and snow are".

The remaining, or "neutral" items were: "what an airport is"; "the development of lighter-than-air craft"; and "the development of heavier-than-air craft".

In all, 901 items were checked: 337 social studies items; 445 science items; and 159 "neutral" items. The range in numbers of items checked by each superintendent varied from zero at one extreme to fifteen at the other. A distribution of frequencies of responses to question #17 as a whole may be seen in Table XVIII.

17. Table XVIII: Frequencies of Responses to the Question, "Which of the following are presented in the elementary grades in your community?"

No. of checked items	No. of superintendents	Total no. of checked items
0	10	0
1	0	0
2	1	2
3	3	9
4	7	28
5	10	50
6	5	30
7	7	49
8	13	104
9	14	112
10	7	70
11	8	88
12	5	60
13	6	78
14	4	56
15	11	165
qualified	3	-
		Total: 901

One of the reasons for the inclusion of question #17 was as a check.. using superintendents' answers to questions #5 and 6..on the validity of replies. The answers to these questions presumably indicated the presence of aviation integration with the social studies and science areas of the elementary schools represented in the survey. An examination of the results of question #17 and a comparison of those results with those of questions #5 and 6 show that fifty-two of the seventy-six superintendents who had said that aviation was integrated with the social studies in the elementary level in their communities had checked three or more items in the social studies area, while seventy-three of the eighty-five superintendents who had signified science integration with aviation on the

elementary level had also checked three or more science items. The distribution of scores among the superintendents who had answered "yes" to questions #5 and 6 are shown in Tables XIX and XX.

17. Table XIX: Social Studies Frequency v. Integration as Indicated by Replies of Superintendents Claiming Integration

No. of items checked	No. of superintendents
0	6
1	7
2	11
3	15
4	11
5	8
6	16
qualified	2
	Total: 76

17. Table XX: Science Frequency v. Integration as Indicated by Replies of Superintendents Claiming Integration

No. of items checked	No. of superintendents
0	5
1	0
2	4
3	7
4	25
5	29
6	12
qualified	3
	Total: 85

Eighteen of the thirty-six superintendents who had claimed no elementary school social studies integration, and twenty of the twenty-eight who had claimed no elementary school science integration also checked three or more social studies or science items, respectively.

Individual comments to question #17 included:

1. "We have an excellent program of visual education, showing the above and many other types of pictures".

2. "We have an extensive aviation library".

3. "Probably.....when they fit appropriately into the work being done, or when interest is shown".

4. "All briefly in reading".

5. "Our teachers are doing this in various subjects. Quality and degree varies with teacher and school".

6. "Yes, in current events".

7. "All in our basic elementary science book and program".

Additional Comments by Superintendents

That there is an intensity of interest in aviation on the part of Massachusetts school superintendents may be deduced from the number of returns received, over fifty-six percent, in all, of those sent out. It is also quite apparent from the number of comments volunteered by many of the superintendents. Some of these have been incorporated into data already presented. Others, valuable because of their pertinency to the subject of this study, are included herewith.

1. We operate an active Aviation Club.

2. We have a Link Trainer in operation in high school.

3. We still have a surplus plane in the attic.

4. A local merchant is currently offering prizes for the best toy airplane presented to him. There is much interest and the teachers are assisting.

5. We cannot spend money for such things until we have enough to hire qualified teachers. All of the items in your questionnaire should be included in some way in our school program but we have to fight to get anywhere. Do you read the Boston Herald? If so you know the stuff they print to show how expensive our educators are. I wish some student of education would make a study of ways of getting FAIR treatment throughout the press of the country. Only one paper in Boston gives us real help.

6. I was a pilot in the U.S. Air Force and was in the ORC for fifteen years. Also, I taught a five credit course in aeronautics in high school for five years. I believe that we are giving enough emphasis to aviation in _____. However I would welcome more publications such as the Air Force issued during the war.

7. Generally speaking--aviation can serve as an interest center very profitably. Certain aspects of flying should be taught in a general way. I would frown upon any course narrowed for aviation enthusiasts. Public schools are designed for general education.--Math should be general and should be taught for use for all purposes.-- It should never be 'streamlined' to fit the pilot or navigator as during wartime when an emergency existed. These generalizations should never be lost sight of when any course is being planned. It is O.K. to explore the mechanics, the physics, the math, the geography, or anything else that involves flying but as for a specific course for a student,--my answer is no.

Public schools would do the job no more satisfactorily than they did it during the War. Army officers had to destroy concepts developed by incept and inexperienced teachers. I know what I am talking about because I was close to the situation and talked with thousands of students from schools while in the service myself. Their high school instruction was a waste of time.

I hope I haven't a prejudice but I fear I prefer to keep from too much specialization and too narrow instruction for students who have nothing when they leave school.

8. We found it extremely difficult to teach aviation in a small high school without laboratory facilities and a trained instructor available.

We use aviation readers in the lower grades. The middle grade teachers use material made available by the commercial aviation companies, especially charts, pictures, etc., and similar visual material. The children in grade 4 are much interested in types of planes, and often know more than the teachers about same.

In junior high grades, we teach much about sky, clouds, rain, etc., in science.

More and more the new geography material is going to bring out the impact of aviation, but as yet the textbooks have little on it. The teachers know too little about aviation to inspire much enthusiasm. Perhaps when a new generation comes into teaching, who have grown up with aviation, they will be more interested in it, through personal experience in flying.

The local corporation uses planes continuously in commercial travel, from one branch to another,- trips to South Carolina, Mexico, etc. There are privately owned planes in town, garaged either at Mendon or Grafton. Our nearest commercial airport is Worcester, about 20 miles away, and Boston about 35 miles away.

In the high school, among the older boys, interest divides between trying to get into the navy or aviation in armed service branches.

I would say that at present the greatest handicap lies in lack of teacher preparation and interest in field of aviation.

Still a third indication of the intensity of interest in the question of aviation integration in public schools of Massachusetts may be seen from the fact that forty-six of the 117 superintendents had in one way or another indicated their return-addresses although replies were originally intended to be anonymous. And of those who did give a return address, several were among those who commented so extensively <u>supra</u>.

CHAPTER V

ANALYSIS AND EVALUATION OF THE SURVEY

On the Elementary Level

Social studies and science integration: A majority (66.7 per cent) of Massachusetts school superintendents who replied to the survey claimed that aviation was integrated with work in the social studies area in their schools. Integration was highest in the "small" communities (80 per cent), only slightly less in the "large" (77.5 per cent), and noticeably smaller in the "medium" (52.9 per cent).

Aviation integration in the science area in the elementary grades was even more marked than in the social studies area, with 74.5 per cent of all superintendents claiming such integration. The "small" and "large" communities in the survey again had greater integration than the intermediate communities, although in this instance differences in the extent of integration from group to group were not as marked ("small" communities: 73.5 per cent; "medium": 70 per cent; and "large": 84 per cent).

Integration in the science area was expected to be more marked than in the social studies, first because of the ease with which physical principles and concepts might be applied to the airplane and, second, because of the interest value which airplanes have for children. The actual difference in the extent of integration between science and social studies was found to be 7.8 per cent.

Elementary integration in other subjects: 30 per cent of those superintendents who replied claimed aviation integration with elementary mathematics; 32.4 per cent integrated aviation with art work; while only 21 per cent integrated aviation materials with work in the language field.

The fact that language integration fell lower than integration in any elementary field is surprising, especially in the light of the availability of printed matter on aviation (the Air Age series published by MacMillan Company, for example). This may be explained, however, by the fact that school systems cannot for financial reasons, or will not, buy up-to-date textbooks for their students.

If a lack of modern textbooks does exist it would probably be more noticeable in small, semi-rural communities, many of which have less funds available for education, than in larger, more urban communities. Out of the 108 instances in which aviation integration other than in the science and social studies areas was indicated, 40 per cent were actually found in "large", 31.4 per cent in "medium", and 28.6 per cent in "small" communities. The fact that aviation education in mathematics, languages, art, and other subjects does decrease with corresponding decreases in population therefore tends to substantiate the above hypothesis.

On the Secondary Level

Intensity of integration on the secondary level: Only in the physical sciences, where 69.6 per cent of the 109 communities with secondary schools expressed extensive or frequent aviation integration was actual intensity of integration found. The further the subject from the science area, the less was the integration noted. For example, in mathematics, 29.4 per cent of the communities polled expressed extensive or frequent inclusion of aviation materials; in biology, 19.5 per cent; in English, 10.1 per cent; and in language..taken to mean languages other than English..4.6 per cent.

Extensiveness of aviation integration: An examination simply of the presence of aviation integration, irrespective of extensiveness of inclusion, in the subject areas investigated showed the same order of interest except for English, although a greater distribution in integration. The order of frequency of aviation integration on the secondary level was physical sciences (89 per cent); mathematics (87.2 per cent); biology (60.6 per cent); English (71.6 per cent); and language (48.6 per cent).

The diversity of aviation integration,..from art at one extreme to elements of aeronautics at the other.., as well as the profusion of courses integrated with aviation within the curricula of several individual schools, was remarkable (see Chapter IV).

Special courses in aviation: Only 12.8 per cent of the communities which have secondary schools include a special course in aviation in their curricula, while 87.2 per cent do not. The reasons for the discontinuance of these courses (mentioned in Chapter IV), as well as the fact that many courses..once discontinued..were replaced by units or topics on aviation within the body of existing courses in physical science, shows that no effort was made to revise course objectives to meet the general (i.e. life in the Air Age) rather than specialized (i.e. wartime) needs of students.

Elementary and Secondary Levels Combined

The presence of airports: While practically every community in Massachusetts does have access to airport facilities, in many instances airports are not conveniently accessible. Of the 114 communities polled for the survey, 74.5 per cent had airports which might be considered in the convenient category.

Interest in aviation v. the presence of airports: In comparing interest in aviation with the presence of an airport in various communities, it was found that seventy communities, or 82.4 per cent of the eighty-five communities with airports, mentioned elementary aviation integration in either the social studies, science, or both areas. Fifty-one of the seventy, or 73 per cent had integration in both areas.

Twenty of the twenty-nine communities without an airport nearby, (68.6 per cent) had integration either in one or both areas, with eighteen of the twenty (90 per cent) having integration in both.

Use of airports by commercial planes: 42.2 per cent of those communities which had ready access to airports stated that their airports were used by commercial planes. This group, constituting 31.6 per cent of all communities polled, might therefore use the facilities of the large airlines in the conducting of "flying classes". Actually, even those communities without any airport facilities whatsoever could participate in flight experiences, as judged by the reply of one superintendent whose students had taken group flights although no airport was conveniently accessible to them. In most instances, however, the easier a problem is of attainment, the more readily is it accepted.

Community size apparently has some bearing upon the presence or absence of airport facilities in a community. This factor affected the communities included in the survey as follows: 66.7 per cent of the "small", 79.3 per cent of the "medium", and 74.2 per cent of the "large" communities had airports nearby. Apparently then, the size of a community has only small influence upon the presence or absence of an airport in that community.

Community size as an important factor in determining airport size is shown as far as the communities in this survey are concerned as follows. Considering the use of an airport by commercial airlines as an indication of a large airport, a total of 80.6 per cent of all "airport" communities whose airports are used by airlines fall into the "large" or "medium" group (41.7 and 38.9 per cent respectively) while only 19.4 per cent are "small".

Interest in aviation v. airport size: In comparing interest in aviation education with the size of airports found in the various communities it was seen that thirty of the thirty-six communities (83.4 per cent) with large airports, mentioned elementary integration with aviation in either social studies, science, or both. Twenty-five of these thirty (83.5 per cent) were integrated in both. Thirty-four of the forty-four who had no large airports (77.3 per cent) also had integration in either the social studies, science, or both areas; while of these thirty-four only 53.8 per cent had integration in both.

Field trips: The larger the community, the greater was the number of field trips to airports. Of the fifty-one communities which took field trips, 27.4 per cent were "small", 35.3 per cent were "medium", and 37.3 per cent were "large". The slight increase in the extent of use of field trips from group to group may be explained by the attraction value of larger airports in larger communities. However, the fact that no large airports were nearby did not prevent several communities from conducting field trips.

Past participation in flights: Only 9.7 per cent of all the communities participating in the survey allowed student flights in the past five years. Distribution according to community size shows that 16.6 per cent of the "small", 7.6 per cent of the "medium", and 6.5 per cent of the "large" communities replying to the questionnaire actually participated in flights. Thus, the larger the community, apparently the less chance there was for the conducting of flights.

Possible future participation in flights: 65 per cent of all superintendents polled said that they would allow flights under some circumstances. 11.4 per cent gave no answer and a like amount gave qualified answers. Those who refused to answer were drawn entirely from "large" and "medium" communities (71.4 per cent and 28.6 per cent respectively), which appear as a group less willing to discuss possible flight experiences than "small" communities. The reasonsoffered by various superintendents opposed to flights are enlightening commentaries upon the problems facing any school system planning "flying classes". Most comments stressed preliminary approval by school committees, the need for parental consent, and the need of removing the threat of liability from the shoulders of school authorities.

"..if your school system financed flights..": 31.5 per cent of the superintendents said "yes", while 35 per cent said "no" to the possibility of flights financed by their school systems. Examination of answers according to the size of responding communities showed no great trends from group to group, with 33.3 per cent of the "small", 28.2 per cent of the "medium", and 35.6 per cent of the "large" communities expressing themselves as in favor of flights so sponsored.

"..if parents financed the flight..": 65.8 per cent of the superintendents agreed to student flights financed by parents, while 12.3 per cent said "no" to flights under such circumstances. According to the size criterion, 20 per cent of the "small", 13.4 per cent of the "medium", and 6.3 per cent of the "large" group were in favor of parental financing of flights. Considering the fact that such a means of financing flights would remove a burden from communities participating in student flight experiences, it seems strange that it should be considered less by large communities than by small.

"..if the school raised funds by a sports event, play, or the like": 13.2 per cent of the superintendents said "yes" while 14 per cent "no" to the proposal to use school-raised funds for flight purposes. According to community size, 20 per cent of the "small", 13.2 per cent of the "medium" and 6.5 per cent of the "large" communities favored such a plan. Apparently, the smaller communities preferred such a method for financing funds more readily than the larger. This was, perhaps, because greater demands and restrictions were placed upon the use of funds so used in larger communities.

"..under any circumstances other than those listed above": All other circumstances under which superintendents would consider student flights hinge upon methods of financing such ventures other than by school systems, parents, and fund-raising school activities. For a more thorough itemization of those methods actually suggested, see Chapter IV.

Past means of financing flights: Suggestions for financing "flying classes", include: (1) a special appropriation from the board of education; (2) a school fund; (3) Parent Teachers' Association; (4) assistance

from individual parents; (5) student work after school; (6) student selling scrap, running of plays and the like; (7) the charging of weekly class dues; (8) help from individuals or civic organizations in the community; and (9) a combination of any of the foregoing.[1]

Of these suggestions, four... financing by parents (suggestion #4), student work (#5), sponsorship by civic organizations (#8), and several combinations (#9)...were actually used by the communities which had conducted flights.

Additional methods of financing flights, not mentioned above but actually employed according to several superintendents, are: (1) 4-H Clubs, (2) class funds (perhaps related to suggestion #7 above), and (3) suggestions, "free", found several times. Emphasis upon the possibility of free flights was a common and expected reply for the obvious reason that school systems are for the most part taxed to the utmost, to meet the regular demands upon their finances, with no resources available to set aside for student flights. The need for outside financial assistance by state, federal and private agencies to help defray operating expenses of flight experiences must therefore be urged repeatedly in order for flight experiences to become a reality in many school systems.

The extent of parental interest and cooperation: Parents of students who participated in flights in Massachusetts during the past five years were in some instances extremely interested in and cooperative towards efforts to institute flight experiences in their communities. In other

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[1] "Organization of an Air Travel Project", unpublished mimeographed brochure, Air Age Education Research, New York, New York, p. 4.

instances they were but moderately interested and cooperative while in still others they showed neither interest nor cooperation. A true estimate of parental cooperativeness is difficult to ascertain, what with pressure from children and other parents brought to bear in influencing, consciously or unconsciously, any decisions on their part. Further research into this problem is suggested.

"Which of the Following Are Presented in the Elementary Grades In Your Community?"

68.5 per cent of the superintendents who claimed social studies integration with aviation checked three or more of the social studies items included in question #17. 86 per cent of those who claimed science integration checked a similar number of the included science items. Apparently then, better coverage is being given to aviation integration with science than with the social studies in 182 elementary schools which were included in the survey

The fact that 50 per cent of those superintendents claiming no elementary aviation integration with social studies, and 71 per cent of those similarly claiming no integration with science at that level also checked three or more appropriate items, shows apparently that there is a higher integration between aviation and these areas than indicated by superintendents. Perhaps the discrepency is explained by the possibility that what time was spent in these areas upon aviation materials was not considered by superintendents sufficient to warrant the title, "integration".

The Problems of Validity and Reliability

Validity: To the extent that a questionnaire employed in any survey ascertains the information for which it is constructed, it is said to be valid. Thus validity in this particular study is chiefly a result of care in the construction of the questionnaire which was employed. Such factors as the inability of superintendents to answer accurately, and improper presentation of items in the questionnaire would tend to reduce the validity of results of this survey.

An effort was therefore made to present all items as simply and unambiguously as possible. Every effort was also made to eliminate personal bias from the questionnaire form, as any bias would tend to reduce the validity of results. Validity would also be reduced to the extent that the percentage of questionnaires from superintendents favoring a viation integration outnumbered the percentage from those not favoring it.

According to Koos,[1] the four precautions preliminary to sending out a questionnaire are: (1) very careful formulation by the author and arrangement in the form to be used; (2) submission to some expert for advice and correction; (3) try-out on teachers or others not primarily concerned; and (4) a try-out on a group as nearly like the ones to whom it is to be sent as possible.

All but the last of these precautions, a pre-test, forestalled because the entire group of Massachusetts school superintendents was used in the survey, were taken. Certain weaknesses in the questionnaire

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[1] Koos, L.V., The Questionnaire in Education, (Macmillan Company) New York, 1928, p. 163.

therefore did occur, to be pointed up by the returns from various superintendents.

In question #8, an intensity scale for work in the social studies might have been included.

In question #9, provision might have been made for a third response, "did, but do no longer" to the question, "Does your community offer a special one-year course in aviation on the high school level?"

An arbitrary distance of fifteen miles as a determinant of nearness might have been added to question #10.

There might also profitably have been an eighteenth question, "Are decisions of policy, such as sanction for student flights, left to you or to a school committee?" Such a question, however, might easily have caused antagonism on the part of some respondents, and was therefore excluded.

Reliability: Reliability ranks with validity as a major problem in any survey. In this particular instance, the questionnaire employed is reliable to the extent that it succeeds in measuring "anything consistently, no matter how much what it does measure differs from what it is intended to measure."[1]

Reliability is also a result of the distribution and variety of superintendents to whom the questionnaire was sent. Results are not considered reliable for Massachusetts superintendents as a whole, for example, if forms are submitted to superintendents only from large communities. As reliability is thus the result of proper sampling, any

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1 Lindquist, E.F., A First Course in Statistics, Boston, (Houghton Mifflin Company) 1942, p.233

questionnaires sent out to all Massachusetts school superintendents would necessarily have a certain reliability.

A further criterion of good reliability is the total number of questionnaires returned. The use of a simplified questionnaire, inclusion of an explanatory letter, and the other steps taken to insure increased returns, would therefore all contribute towards a greater degree of reliability.

The fact that returns totalling over 55 per cent of those questionnaires sent out were actually received attests to the high degree of reliability achieved.

CHAPTER VI

CONCLUSIONS

The results of the organization and analysis of the data compiled in this study justify the drawing of certain conclusions. To the extent that the various data upon which conclusions are based are valid and reliable, to that extent are individual conclusions justifiable. Most conclusions are derived from the survey conducted of aviation practices in the public schools of Massachusetts. As that survey was conducted with certain purposes in mind (Chapter III) conclusions are here enumerated in terms of those purposes.

Current Practices in Aviation Education in the Elementary and Secondary Schools of Massachusetts

Work in a great majority of both the elementary and secondary schools of Massachusetts includes aviation materials in the science area.

Many elementary schools also integrate work in the social studies (approximately 70 per cent), as well as in mathematics, language, and art (from 20 to 30 per cent in each case) with aviation. In addition, some elementary schools use aviation in music, rhythmics, physical education, and other subjects.

On the secondary level, almost all communities (87.2 per cent) have aviation materials in mathematics, while a majority include such materials in biology and English. In the language area approximately one-half of Massachusetts communities use some aviation materials.

Other fields which show but slight aviation integration at the secondary level in Massachusetts include: art, general electricity, guid-

ance, driver education, geography, health education, and manual arts. Social studies integration, included in the survey at the elementary level but excluded at the secondary level, was also mentioned, but by far fewer communities than was expected from similar integration on the elementary level.

The special courses in aviation found in the secondary curricula of some communities include: aeronautical mathematics and electricity, navigational meteorology, pre-flight aeronautics, airplane service, airplane mechanics, and elements of aeronautics.

The Extent of Integration Between Aviation and Education in Massachusetts Public Schools

Elementary schools: As judged by replies received from 114 Massachusetts school superintendents, over two-thirds of the communities in the state include aviation materials on the elementary level to a greater or lesser degree in work in the social studies. An even greater number, over three-fourth of the communities, include such materials in science work at the elementary level. Approximately one-third integrate mathematics and art with aviation, while a little over one-fifth..using reading materials on aviation..have language work tied in with aviation. Aviation integration, but to an extremely small amount, is found in work done in music, rhythmics, remedial reading, physical education, and the like.

Secondary schools: On the secondary level, approximately 70 per cent of the communities included in the survey, as judged by returns, expressed either extensive or frequent inclusion of aviation materials in work in the physical sciences. In all other areas other than the

social studies, extensive or frequent aviation integration fell to below 30 per cent (mathematics: 29.4 per cent; biology: 19.5 per cent; English: 10.1 per cent; and language: 4.6 per cent).

Actually, however, secondary school aviation integration by far surpassed in distribution that found on the elementary level. Approximately 90 per cent of the communities which had secondary schools used aviation materials in the physical sciences and mathematics; approximately 70 per cent did so in English; 60 per cent in biology; and 50 per cent in languages.

Also, on the secondary level, special courses in aviation..included during the war years..had been discontinued in all but 13 per cent of the communities "for lack of student interest of demand", rather than being modified to fit the existing general needs of students.

The Educational Areas Which Emphasize, and Those Which Ignore the Possibilities of Aviation Education Within the Framework of School Curricula

Those areas in elementary and secondary education which emphasize the possibilities of aviation integration have already been set forth. Those which ignore any such possibilities, as shown by the infrequency with which replies in those areas were set forth, have also been mentioned. Apparently, the realization that motivating materials are either being ignored or wasted has not yet come in such fields as health, art, driver education, guidance, music, remedial reading, and many others. The more widespread such realization becomes, the more rapidly will equally widespread acceptance of the Air Age be.

The Correlation Between the Presence and Size of Airports, and Interest in Aviation

Integration in aviation v. the presence of an airport: Apparently the presence of an airport has a positive correlation with interest in aviation in schools, but to a slight degree, judging from the fact that 82.4 per cent of communities with airports nearby claimed aviation integration in either elementary social studies or science work, while 68.8 per cent of communities with no airports nearby included aviation materials in either of those areas in elementary work.

Integration in aviation v. the size of existing airports: Here also a positive correlation is noted between airport size and school interest in aviation, with 83.4 percent of communities with large airports showing integration at the elementary level, while 77.3 per cent of communities with small airports show similar integration. More strikingly, in this instance a far greater number in the former group (83.4 per cent) showed integration in both elementary social studies and science work than in the latter (53.8 per cent). That community size itself correlates positively with airport size leads to the conclusion, then, that large communities integrate more highly with aviation education than small.

The Correlation Between the Size of Communities..As Indicated by Secondary School Population..and Interest in Aviation

The following conclusions are based upon observable differences in the extent of interest in aviation education from population grouping to grouping.

1. "Small" and "large" communities apparently have greater aviation

integration on the elementary level than do "medium" in both social studies and science work.

2. In elementary subjects which do not commonly include aviation materials, the larger a community the greater the chance that it might include such materials.

3. "Small" communities tend to have aviation integration with already existing courses in the physical sciences, and do not have special courses in aviation at all. This is understandable from the standpoint that small school systems cannot as readily get teachers qualified for a special course in aviation constructed strictly for general education. "Large" communities appear to have many more instances in which special courses are found than do even the "medium" communities.

4. Community size correlates only slightly with the presence of airports.

5. There is a positive correlation between community size and the conducting of field trips to airports.

6. The percentage of communities taking flights decreases with increasing community size. Apparently the larger communities fear the legal, and other, complications of flights more than do the smaller.

7. "Large" and "medium" communities were more reluctant to discuss the possibility of future flights than were "small" communities.

8. No trends according to community size were seen in replies concerning the possibility of flights financed by individual school systems.

9. The larger communities were less willing to consider flights financed by parents than were the small.

10. Larger communities were less willing to consider flights financed by school-raised funds also.

11. The number of communities whose students had taken flights was too small to attempt to analyze with respect to parent interest and cooperation, from "small" to "large" communities.

The Intensity of Interest in Aviation Education as Shown by Field Trips Taken by Public School Classes to Airports

The fact that approximately 45 per cent of all communities polled had conducted field trips in the past five years, taking elementary and secondary classes to observe meteorological equipment, control towers, hangar and repair facilities and the like, in addition to airplanes, speaks well for aviation education in Massachusetts. Apparently, however, 30 per cent of the communities with airports nearby, in addition to 25 per cent with possible access to airports within travelling distance, have had no field trips integrated with aviation in the past five years.

The Extent of School-Sponsored or School-Integrated Flights

The number of communities which participated in flights within the past five years is exceedingly small. Factors which would increase this number would be, judging from returns received; (1) decreased fares; (2) complete removal of fares; (3) removal of the threat of liability from the shoulders of school teachers and other school authorities; and (4) a decrease in airplane accidents.

The Means by Which Past Educational Flights Were Sponsored

Although any community would prefer flights which were free or at reduced rates to those charged by airlines at regular rates, where various communities did decide upon flights for students, originality was shown in the means by which they were financed. Such methods as service clubs' sponsorship, athletic association sponsorship (for a flight by their football team), class funds and the like were all successful means of raising funds for such a venture.

The Extent of Parental Interest and Cooperation in Educational Flights

Information on this subject is limited. Apparently, however, parents did show enough interest and cooperation to permit their children to fly though with what misgivings..if any.. this study did not attempt to ascertain. A range in interest and cooperation from "none" to "100 per cent" signifies the controversial nature of the subject.

The Conditions Under Which Flights By Student Classes Would be Considered by Superintendents

The most acceptable condition under which flights were thought possible was that which mentioned parental financing. This method would serve two purposes: pay expenses, and at the same time signify parents' willingness to accept responsibility for any mishap which might occur, (all despite the fact that teacher liability still remains inspite of parental avowals that they have accepted all responsibility).

Great interest was also shown in flights financed by school systems. The reason for this interest is apparently that superintendents associate

payment by school committees with approval, by them, of such a venture. Thus, despite the financial burden upon the individual communities, flights locally financed received widespread approval.

Other means by which flights might be financed according to the suggestions of various superintendents were: "Raise money from interested citizens"; "by service clubs"; "if all expenses were paid by sponsors of Air Education"; and "by invitation of airlines or airports".

Generalizations About "Flying Classes" From the Intensity of Interest Shown by Massachusetts School Superintendents

It would be premature to make any generalizations about the feasibility of "flying classes" without first attempting to evaluate their results in terms of educational outcomes. However, enough general approval by school administrators and teachers is available to have warranted this study.

In general: "Flying classes" are a fait accompli. From the standpoint therefore that they have been conducted on numerous occasions, they are feasible. There appears to be reluctance on the part of many school systems, however, to participate in flight experiences. Apparently this reluctance will continue until (1) more teachers are trained to appreciate the possibilities of the Air Age, (2) airlines reduce fares still further, (3) teachers and administrators no longer have to fear the legal aspects of liability for student accidents, and (4) airline accident rates decrease appreciably.

Specifically: The discrepency between actual flights and statements asserting the intention of participating in future flights leads to but

two alternative conclusions: either school systems do actually contemplate widespread flights in the near future; or more reasonably, superintendents..and school committees as well..who might favor student flights in theory will still refuse to allow them in practice until such time that those factors which discourage flights are corrected. Until that time, "flying classes" are not feasible for a majority of school systems.

Suggestions for Future Research

The following problems..either mentioned or implied in the body of this study..are all intimately related to that of the feasibility of "flying classes". They are therefore suggested as worthy of future research.

1. A determination of the extent of parental approval of student flights.

2. A determination of the extent of approval, by school committees, of student flights.

3. The relationship between community interest and/or participation in student flight experiences, and the financial level of various communities.

4. Air safety as a factor in community reluctance to consider student flights.

5. Flying expenses as a factor in community reluctance to consider student flights.

6. Teacher liability as a factor in community reluctance to consider student flights.

7. The planning, conducting, and evaluating of a "flying class".

8. An evaluation, from the standpoint of educational outcomes, of the "flying class" as a "special method" for educating students.

The Educational Implications of This Study

Living as we do in an Air Age, an age of great technological advances which have already far outstripped in importance those of the Industrial Revolution, we have seen the extensive use of the air as a medium for travel by businessmen and professional men alike. Such extensive use is directly attributable to two factors: speed and accessibility.

These same factors are of importance to educators as well, in their constant search for teaching methods which will provide a maximum of educational value from the standpoint of suitability, motivating ability, and the like while at the same time being practical. For, classes limited up to this period in educational history to their immediate environment for living "real-life" motivating experiences, may now overcome time and distance as barriers and increase the boundaries of their immediate environments. Sectionalism throughout the world has given way to nationalism and that, in turn, to internationalism. Some areas in the United States, however, are still sectional in thought..educational and other.., while all too few educationally have an international outlook reflected within school curricula.

The "flying class" has been proposed as a method of overcoming sectionalism, nationalism, and the limitations of immediate environments while at the same time providing the emotional element in teaching needed for much educational motivation.

This study has shown the recognition of the Air Age by most

Massachusetts communities but the impracticality of "flying classes" as yet in all but a few. It has also shown, however, that acceptance of the possibilities of "flying classes" hinges on the correction of but a few conditions. Future "flying classes" are definitely feasible.

APPENDIX

Table XXI: General Information Table

1. 982 The number of elementary schools in your community (or superintendency)

2. 172,000 Approximate total enrollment

3. 221 The number of secondary schools in your community (or superintendency)

4. 182,000 Approximate total enrollment

On the elementary level (grades 1 - 6) in your community:

5. Is work in the social studies integrated, or "tied in", with aviation?
(76) Yes
(37) No
(1) Don't know

6. Is work in the science area integrated with aviation?
(85) Yes
(28) No
(1) Don't know

7. Is any other work on the elementary level integrated with aviation?
(35) Mathematics
(24) Language
(37) Art
(9) Qualified
(12) Other: (qualify) remedial reading, reading, physical education, music, rhythmics, current events

On the secondary level (grades 7 - 12 or 14) in your community:

8. Is work on the secondary level integrated with aviation?

a. Mathematics	b. English
(2) extensively	(0) extensively
(30) fairly often	(11) fairly often
(63) slightly	(68) slightly
(6) not at all	(15) not at all
(3) qualified	(3) qualified

c. Languages
(0) extensively
(5) fairly often
(48) slightly
(35) not at all
(3) qualified

d. Biology
(2) extensively
(19) fairly often
(45) slightly
(24) not at all
(3) qualified

e. Physical sciences
(16) extensively
(60) fairly often
(21) slightly
(3) not at all
(3) qualified

f. Other courses tied in with aviation: (qualify) see Chapter IV

9. Does your community offer a special one-year course in aviation on the high school level?
(14) Yes
(95) No

10. Is there an airport in, or near, your community?
(85) Yes
(29) No

11. If so, do any of the commercial airlines use the airport?
(36) Yes
(44) No
(5) Don't know

12. Have any classes in your community been taken on field trips to airports in the past five years?
(51) Yes
(52) No
(10) Don't know
(a) ? The number of such trips, if any, taken by secondary school classes
(b) ? The number of such trips, if any, taken by elementary classes

139# Total number of trips taken

13. Have any classes been taken on flights in the past five years?
(11) Yes
(98) No
(5) Don't know
(a) 282+ The approximate number of students taken aloft, if any

14. Would you allow classes, which had first secured parental permission, to participate in an educational group flight

(a) if your school system financed the flight at $0.05 (five cents) per passenger-mile?
(36) Yes
(40) No

(b) if parents financed the flight?
(75) Yes
(14) No

(c) if the school raised funds by means of a sports event, play, or the like?
(15) Yes
(16) No

(d) under any circumstances other than those listed above?
See Chapter IV

15. If flights were held in the past, how were they financed?
See Chapter IV

16. If student flights were made, or attempted, what was the extent of parent interest and cooperation?
See Chapter IV

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17. Which of the following are presented in the elementary grades in your community?

Science Items
( ) how a plane flies
( ) what wind is
( ) the biology of flight
( ) weather forecasting
( ) what clouds are
( ) what rain and snow are
445: Total Science Items checked

Social Studies
( ) man's desire to fly
( ) communications
( ) aviation and world peace
( ) aviation and national security
( ) community dependence on aviation
( ) the airplane and changing concepts of distance and time
337: Total Social Studies Items checked

Neutral Items
( ) what an airport is
( ) development of lighter-than-air craft
( ) development of heavier-than-air craft
159: Total Neutral Items checked

Letter to Mr. Bernardo of the Civil Aeronautics Administration

624 Norfolk Street
Mattapan 26, Mass.
December 13, 1948

Mr. James V. Bernardo
Asst. to the Regional
Administrator
Civil Aeronautics Administration
385 Madison Avenue
New York 17, New York

Dear Sir:

Miss Alice Beal, Supervisor of Elementary Education, the Massachusetts Department of Education, has told me of your interest in the future role of aviation in education. She suggested that I write to you with reference to my research work at the Graduate Department of Education, Boston University.

I am at present conducting an investigation into the feasibility, financially and otherwise, of using airplanes to transport public school classes to places of educational value not otherwise easily accessible (e.g. Boston to Philadelphia and back in one day). Having seen the cooperation of the Civil Aeronautics Administration with the Massachusetts Aeronautics Commission and the State Department of Education with respect to institutes for teachers, I wondered whether the Civil Aeronautics Administration participates in "flying classes" for students and, if so, how extensive such projects are.

I should like to speak to you personally about this as well as such things as the possibility of attending and evaluating either an aviation institute for teachers or, preferably, an educational flight by students; the question of parental consent; insurance provisions; etc.

As I expect to be in New York for the Christmas weekend, might I see you on Monday, December 27? If this is impossible, I would appreciate as much information as you can offer by mail.

Sincerely,

Melvin Silberberg

Mr. Bernardo's reply:

In reply address
REGIONAL MANAGER
CIVIL AERONAUTICS ADMINISTRATION

DEPARTMENT OF COMMERCE

CIVIL AERONAUTICS ADMINISTRATION

385 Madison Avenue
New York 17, N.Y.
Ref. 1-140

December 16, 1948

Mr. Melvin Silberberg
624 Norfolk Street
Mattapan 26, Mass.

Dear Mr. Silberberg:

I have your letter of 13 December 1948 in which you request information relative to aviation operations institutes for teachers.

Since you expect to be in New York for the Christmas weekend will you please give my office a call on Monday, December 27th. If I am in I will be happy to see you and to discuss this matter with you. I regret that I am not in a position to make a precise appointment since one member of my family is in a serious condition of ill health and it may become necessary for my family to be out of the state for the Christmas holidays.

In the event that I do not get to talk to you personally I will send you as much information as possible about the problems contained in your recent letter.

With very best wishes for the holiday season, I am

Sincerely,

J. V. Bernardo
Assistant to Regional Administrator
for Aviation Training

Letter to Captain Rickenbacker of Eastern Airlines

624 Norfolk Street
Mattapan 26, Mass.
November 11, 1948

Captain Eddie Rickenbacker
President, Eastern Airlines
10 Rockefeller Plaza
New York 19, New York

Dear Sir:

Your radio speech of last Thursday, November 4th, which mentioned the educational possibilities of air travel, has prompted me, as a graduate student in the Department of Education at Boston University, to institute a study of the feasibility of flying classes. Such factors as the extent of such flights to date, the expense entailed, insurance provisions, teaching aids available, the optimum number of students per trip, aprents' opinions, and many others, must be considered by school systems contemplating educational flights.

I would therefore appreciate whatever assistance you can offer in the following: (1) obtaining a copy of your speech, to which reference was made above; (2) answering at your convenience the questions which accompany this letter; (3) offering additional suggestions which would be of assistance to me in actually conducting a trip with a class of school children from Greater Boston, such a trip constituting a validation of the study.

I hope that your interest in educating the youth of America will be matched by others, so that flying classes may soon become a widespread rather than isolated form of educational experience.

Sincerely,

Melvin Silberberg

Questionnaire included with letter to Captain Rickenbacker:

1. Has your airline been used to date to transport classes?_____

2. If so, how long has this service been in operation?_____ years.

3. Approximately how many flights have been made of this nature?
   a. ___ elementary or intermediate school children
   b. ___ high school students
   c. ___ college students

4. What was the average size of the classes? _____

5. What would be the optimum size of such a class? _____

6. Do you have student rates for such flights? _____

7. If you do, or if you might consider instituting such rates, what might such rates be? _____

   _____.

8. What provisions are there for insuring such classes? _____

   _____

   _____.

9. What classroom aids, such as blackboards, maps, etc., are available?

   _____.

10. Additional information that you consider pertinent:

    _____

    _____

    _____

    _____

11. Suggestions that might be of value in conducting such a study, or in planning such a trip:

Mr. Newland's reply to a letter similar to that sent to Captain Rickenbacker, which asked for: 1. the price of student flights; 2. educational facilities (e.g. audio-visual aids) provided; 3. transportation to and from airports; 4. statistics on airplane accidents; 5. insurance provisions; 6. the success and extent of past educational flights.

AIR-AGE EDUCATION RESEARCH

100 East 42nd Street, New York 17, New York
Telephone Murray Hill 3-9000

December 3, 1948

Mr. Melvin Silberberg
624 Norfolk Street
Mattapan 26, Massachusetts

Dear Mr. Silberberg:

Please accept my apologies for the tardiness of this reply. I have been doing considerable traveling and only now have I had time to answer.

In answer to your questions:

1. Some schools have taken trips on the regular scheduled airlines and have paid the regular fare which amounts to about $.06 per passenger per mile. Others with larger parties have chartered various planes with seating capacities of twenty-one to fifty-two. This rate per passenger mile is about $.04½.

2. I am not just sure what you meant by "facilities available." Do you mean on the plane or at the destination? We have, as pre-trip materials to be used in enrichment of the flight, such things as maps, aerial photographs, motion pictures and slide-films.

3. The airline makes the above mentioned aid available, consults with the school on plans as to stops enroute, places to visit, etc., as well as making all arrangements for the transportation, as indicated in the enclosed brochures.

4. These statistics are available through the Civil Air Board and the Air Transport Association.

5. In the past, the schools have arranged for group insurance which comes at a very low rate. The airlines carry their own liability, etc.

6. Attached is a copy of an evaluation study which will give you the information.

AMERICAN AIRLINES, INC. SHEET NO. 2

Mr. Melvin Silberberg December 3, 1948

7. To date, we have had trips of all kinds from an hours flight around a city to round trip tours coast-to-coast covering a period of six weeks. The success can again be determined from the reactions contained in the evaluation mentioned above.

8. We shall look forward to your trip from Boston when you decide where you want to go so that we can assist you.

We will be very happy to have the results of the research and I hope that my comments on your breakdown of subjects will be helpful.

Most sincerely,

Kenneth E. Newland
Director of Air-Age
Education Research

KEN:hos

Enc. 3

Letter to Mr. Stern:

624 Norfolk Street
Mattapan 26, Mass.
January 23, 1949

Mr. Ben Stern, Director
Office of Aviation In-
formation and Statistics
Commerce Building
Washington, D. C.

Dear Mr. Stern:

When I spoke to Mr. Bernardo of the Civil Aeronautics Administration in New York last month, he suggested that I write to you to get certain information needed for a graduate thesis which I am writing...in the field of air education for public schools...at Boston University.

Two phases of my study, the questions of administrative and of parental permission for student flights, relate closely to aviation accident statistics, insurance provisions for public school classes, certification requirements, and the like. Of these, I understand that your office can furnish the first, namely latest figures on aviation accidents and fatalities...compared, if possible with automobile, bus, or train accident statistics of equal recency.

Any other available information related to group flights, such as group insurance provisions, which might not be readily accessible in current periodicals would also be invaluable to me in getting an accurate picture of the problems involved in planning and conducting a "flying class" with public school classes.

I shall look forward to hearing from you in the near future.

Sincerely,

Melvin Silberberg

Mr. Stern's reply:

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON 25

January 27, 1949

Refer to CP: A-240

Mr. Melvin Silberberg
624 Norfolk Street
Mattapan 26, Mass.

Dear Mr. Silberberg:

In reply to your request of January 23, we are sending you a comparative accident data table for the years 1936-1947, taken from our Statistical Handbook.

The Aviation Education Section of the CAA has information and material which will be helpful to you in preparing your study. We have forwarded your letter to that office for further reply.

If we can help you in any other way, please let us know.

Sincerely yours,

Ben Stern
Assistant Administrator
for Aviation Information

Enclosure

Letter from Mr. Frederick B. Tuttle, Civil Aeronautics Administration

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON

February 1, 1949

Mr. Melvin Silberberg
624 Norfolk Street
Mattapan 26, Mass.

Dear Mr. Silberberg:

Your letter of January 23 addressed to Mr. Ben Stern, Director, Office of Aviation Information and Statistics, has been referred to this office, in order that you may be supplied with additional information on such administrative matters as parental permission for student flights, insurance, and other aspects of flight experience programs in connection with aviation education courses.

We are enclosing An Airport Laboratory Plan For Students in Secondary Schools and Colleges and Aviation Education in Pennsylvania Schools, both of which have paragraphs devoted to your problem. For other aspects of the insurance problem, we suggest you write Associated Aviation Underwriters, 90 John Street, New York 7, N.Y. This organization handles much aviation insurance and appears to be interested in aviation education problems.

We hope that this information will be of assistance to you.

Sincerely yours,

Frederick B. Tuttle, Educationist
Aviation Education Division
Aviation Training Staff

Enclosures

Letter to Professor Curtis:

624 Norfolk Street
Mattapan, Mass.
January 21, 1949

Professor Henry Curtis
Chairman, Department Geology
Hofstra College
Hempstead, Long Island
New York

Dear Professor Curtis:

When I spoke to Miss Savidge of Air-Age Education Research in New York just before New Year's, I learned of your plans to conduct a flying class some time in the near future. Had I known that my Christmas vacation which I spent in Hempstead was so near your home, I would have liked to have spoken to you personally. As is, it was necessary for me to return to Boston and my studies at Boston University Graduate School of Education without so doing.

I am greatly interested in the question of air education, its feasibility and the extent of the benefits accruing from it. In line with this I am at present doing research preparatory to the writing of a graduate thesis tentatively titled "Air Travel as an Aid to Education."

Any information that you might supply as to the actual details of preparation for flight (difficulties, expenses, time entailed in planning, etc.), the flight itself and an evaluation from the standpoint of the objectives that you had in mind in preparing for the flight, would be invaluable to me as an important part of the over-all picture of the "problem" of flying classes. This "problem", as I see it, includes in addition to the actual flights and evaluations thereof, the questions of the cooperation of school administrators, school boards and air lines.

In the event that you have not yet taken your class on its flight, or that you may be planning another flight in the near future, I wonder whether it might not be possible for an outside ovserver, namely myself, to accompany the class, providing that the time of the flight itself will not interfere with my present schedule.

I shall look forward to hearing from you in the near future.

Sincerely,

Melvin Silberberg

Books in the Air-Age Series, published by the MacMillan Company, are:

Arey, C.K., Elementary School Science for the Air Age

Bartlett, H., Social Studies for the Air Age

Cohen, R.N., ed., Flying High

Columbia University, Teachers' College, Aviation Education Research Group, The Science of Pre-Flight Aeronautics for High Schools

Cross, E.A., ed., Wings for You

Fitzpatrick, F.L. and Stiles, K.A., Biology of Flight

Manzer, J.G. and others, Physical Science in the Air Age

Nebraska University, Teachers' College, Aviation Education Research Group, Elements of Pre-flight Aeronautics for High-Schools

Osteyee, G., Mathematics in Aviation

Renner, G.T., Geographic Education for the Air Age

Renner, G.T., Human Geography in the Air Age

Renner, G.T., and Bauer, H. A., The Air We Live In

Willner, G.O. and Neuthardt, E.E., Aeronautics in the Industrial Arts Program

BIBLIOGRAPHY

BIBLIOGRAPHY

BOOKS AND PAMPHLETS

Air-Age Education Research, World Progress on Air Education, New York, 1946

Commonwealth of Massachusetts, Educational Directory, Bulletin of the Department of Education, 1948

Engelhardt, Nickolaus L., Education for the Air Age, New York, the MacMillan Company, 1942

Koos, Leonard V., The Questionnaire in Education, New York, the MacMillan Company, 1928

Lindquist, E.F., A First Course in Statistics, Boston, Houghton-Mifflin Company, 1942

Massachusetts Aviation Education Committee, Aviation Education Material, Boston, Massachusetts Aeronautics Commission and Massachusetts Department of Education, 1946

Pennsylvania Committee on Aviation Education, Aviation Education in Pennsylvania Schools, Department of Public Instruction, Commonwealth of Pennsylvania, Harrisburg, 1944

United States Department of Commerce, Civil Aeronautics Administration, Office of Aviation Training, An Air Laboratory Plan for Secondary Schools and Colleges, 1947

PERIODICALS

Air-Age Education Research, Air Age Education News, all available issues

Brown, W.C., "A Future for Aviation Education," School Life, Volume 30, Number 7, April 1948

Comment, Christian Science Monitor, Magazine Section, October 9, 1948

Editorial comment, Aviation Week, Volume 47, September 8, 1947

Editorial comment, "Air Insurance," Passenger Policies, Business Week, August 4, 1945

Editorial comment, "Air Fare v. Rail," Business Week, September 1, 1945

Editorial comment, "Standard Insurance Now Common In Air Travel," Business Week, May 31, 1947

Editorial comment, "For Safe Flying," Business Week, January 10, 1948

Editorial comment, "Education Classes in the Air," School and Society, Volume 66, October 4, 1947

Editorial comment, "Aviation Education News," School Life, Volume 30, Number 4, January 1948

Editorial comment, "Aviation Education and Flight Experience," School Review, Volume 53, April 1945

Editorial comment, Air Education shows Rapid Advances in All Branches," Scientific America, Volume 174, January 1946

Editorial comment, "For the Air Age," Time, Volume XI, May 14, 1945

Education, Volume 64, Number 10, (The Air Age Number), June 1944

Fountain, Paul, "Aviation Goes to College," Flying, Volume 37, October, 1945

Storm, Grace E., "Aviation Education," Elementary School Journal, Volume 46, December 1945

BOSTON UNIVERSITY

GRADUATE SCHOOL

Thesis Abstract

TRAVEL BY AIR AS AN AID TO EDUCATION

Submitted by

Melvin Silberberg
(A.B., Harvard College, 1947)

In partial fulfillment of requirements for
the degree of Master of Arts

1949

First Reader..Professor John G. Read
School of Education

Second Reader..Professor Charles E. Stratton,
College of Business Administration

TRAVEL BY AIR AS AN AID TO EDUCATION

Thesis Abstract

THE PROBLEM.

As its name implies, most aviation education up to a few years ago centered around the airplane. Recently, however, a new phase of aviation education....which might be called "the flying class"....began with the first use of airplanes to transport entire classes to places of educational importance not easily accessible by ordinary means of transportation.

It was the purpose of this study to investigate this new outgrowth of aviation, the "flying class", in an effort to determine its feasibility, or practicality, in public schools in general and those of Massachusetts in particular.

PROCEDURE.

The background and current status of "flying classes" were determined by research into the literature on the subject as well as by interviews and correspondence with representatives of the Civil Aeronautics Administration, the Massachusetts Department of Education, American Air Lines, and Eastern Airlines. By the same means data concerning related problems such as the actual advantages of flying over other means of transportation, the expenses entailed in flights, air safety, passenger insurance, teacher liability, and parental consent were ascertained.

Most emphasis, however, was placed upon the results of a questionnaire sent to 210 of the 211 Massachusetts Department of Education. The questionnaire was constructed to ascertain (1) current classroom practices in air education in Massachusetts; (2) the extent of field trips to airports and

student flights in the past five years; and (3) the circumstances under which future flights under school auspices might be allowed by school superintendents.

Returns..approximately 56 per cent of all questionnaires sent..were considered a barometer of nationwide practices and throught re air education, and especially re the practicality of "flying classes". All information was organized, analyzed, correlated as far as possible with community size as determined by school population, and evaluated.

CONCLUSIONS.

On the basis of the information gathered, the following conclusions were drawn.

(1) current practices in aviation education in the elementary and secondary schools of Massachusetts;

(2) the extent of integration between aviation and education in Massachusetts public schools;

(3) the educational areas which emphasize, and those which ignore, the possibilities of aviation education within the framework of school curricula;

(4) the correlation between the presence and size of airports, and interest in aviation in Massachusetts communities;

(5) the correlation between the size of communities..as indicated by secondary school population..and interest in aviation;

(6) the intensity of interest in aviation education as shown by field trips taken by public school classes to airports;

(7) the extent of school-sponsored or school-integrated flights;

(8) the means by which past educational flights were sponsored;

(9) the extent of parental interest and cooperation in educational

flights;

(10) the conditions under which flights by student classes would be considered by superintendents.

From the intensity of interest shown by Massachusetts school superintendents, the following may be said for the future feasibility of "flying classes". In general: from the standpoint that they have been conducted on numerous occasions, they are feasible. However, there appears to be a reluctance on the part of many school systems to participate in flight experiences. This situation will apparently continue until (1) more teachers are trained to recognize the possibilities of the Air Age, (2) air lines reduce fares still further, (3) teachers and administrators no longer have to fear the legal aspects of liability for student accidents, and (4) airline accident rates decrease appreciably.

Specifically: The discrepency between actual flights by school systems in the past and statements asserting the intention of participating in future flights leads to two alternative conclusions: either school systems actually do contemplate widespread flights in the near future; or..more reasonably..superintendents, and school committees as well, who might favor student flights in theory will refuse to allow them in practice until the deterrent factors above are corrected. Until that time, "flying classes" are not feasible for a majority of school systems.

EDUCATIONAL IMPLICATIONS OF THE STUDY.

Living in an Air Age, we have seen the extensive use of the air as a preferred medium of travel by business and professional men alike. Such extensive use is directly attributable to two factors: speed and accessibility.

These same factors are of importance to educators as well, in their constant search for teaching methods which will provide a maximum of educational value from the standpoints of suitability, motivating ability, and the like while at the same time being practical. For, classes limited up to this period in educational history to their immediate environment for "real-life" motivating experiences, may now overcome time and distance as barriers, thus pushing outward environmental limits.

Sectionalism throughout the world has given way to nationalism and that, in turn, to internationalism. Some areas in the United States, however, are still sectional in thought..educational and other..while all too few have an international outlook reflected within school curricula.

The "flying class" has been proposed as a method of overcoming sectionalism, nationalism, and the limitations of immediate environments while at the same time providing the emotional element needed for much educational motivation. This study has shown the recognition of the Air Age by most Massachusetts communities but the impracticality of "flying classes" as yet in all but a few. It has also shown, however, that acceptance of the possibilities of such classes hinges upon the correction of but a few existing conditions.

Future "flying classes" <u>are</u> definitely feasible.

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